

Aircraft performance-based redesign of airport obstacle limitation surfaces

The horizontal obstacle limitation surfaces

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Abstract— Air traffic within highly frequented terminal manoeuvring areas is characterized by a high number of climbing and descending aircraft, varying in size, speed and distance between each other. So collision risk is increased compared to En-route airspace. Additional collision risk with ground based, fixed obstacles have to be taken into account. To protect aircraft from obstacle on ground during procedures in the vicinity of an aerodrome, the first obstacle limitation surfaces were implemented in the 1950's. From today's view current navigation procedures and actual aircraft performance are without clear correlation to the dimensions and shapes of the applied obstacle limitation surfaces. To avoid over and under protecting of specific terminal manoeuvring areas, obstacle limitation surfaces have to be redesign. We present a methodology of obstacle limitation surface redesign and focus on the horizontal surface. This area aims to protect aircraft on non-standardized flight procedures and is characterized by no nominal flight tracks. In consequence, here obstacle limitation surfaces design criteria focus on aircraft performance data, fitting to manoeuvres that can occur within this airspace. As result, new horizontal surfaces are designed and dimensioned in dependence to the ICAO's approach speed category and maximum cross wind components as key influencing parameters for aircraft turning radius. To ensure more practicability of obstacle limitation surface, the paper presents a 2nd optional iteration stage of the surface design. This stage takes local conditions into account, e.g. wind components. As a result, aerodrome-specific downsizing of the horizontal surfaces enables a benefit for urban planning.