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Relationship between Uphill Runway Slope, Acceleration and Takeoff Distance of Fixed - Wing Aircrafts

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Abstract. The present research paper investigated the factors that affect takeoff distance for fixed wing aircrafts. One of the important factors that were studied and analyzed in detail is the runway longitudinal inclination or slope and its impact on determining takeoff distance and takeoff performance for fixed wing aircrafts. To evaluate the potential impact of runways longitudinal slopes on determining the safe and required takeoff distance, the internationally recognized standard limits for these slopes were reviewed. As part of this study, a case study was examined involving an Airbus A380- 800 that tookoff safely from Sydney Airport. The actual takeoff distance was measured on sits and compared with the theoretically calculated takeoff distance, allowing for an evaluation of the accuracy of the applied taking in consideration the runway longitudinal inclination or slope and all other conditions.

Keywords: Takeoff Distance; Ground Run Distance; Performance Chart; Maximum Takeoff Weight; Pressure Altitude; Stall Speed; Takeoff Speed; and Takeoff Performance.