

ABSTRACT

ANALYSIS OF RANGE AND ENDURANCE OF N-219 UNDER POTENTIAL ELECTRIC PROPULSION

by

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As carbon footprint continues to grow, electrical vehicle holds a high value for preventing further damages to the environment. Over the past few years EV has grown rapidly, even to the point where small fixed-winged propeller-driven aircraft were able to be operated under full electric system. But aircraft energy requirement increases exponentially by its total weight. Thus, this research tackle the ability of a 19 seater commuter aircraft to perform under full electric system modification, in which, the N-219 aircraft were made as the base model for this research for its flexibility. Therefore, in order to measure the capability of an all-electric N-219, a comparison between the maximum range and endurance performance of both aircraft is necessary. The airbreathing performance is calculated using Breguet formula for maximum range and endurance. A modification for the Breguet formula is necessary to accommodate the Peukert's effect of a battery (Traub, 2011). To further enhance the analysis, the calculation were made using different scenario such as different payload, fuel/battery capacity, altitude, and airspeed. The result show that, an electric 19 seater aircraft is still very limited in terms of usability, since it can only achieve less than 300 km of range under half payload with current battery technology.

Keyword: *electric aircraft, electric vehicle, Peukert's effect*