ABSTRACT

The rapidly developing technological world has created growing aviation demands regarding aircraft performance, operation and crucially; environmental impact. The urge to achieve aviation sustainability has led the industry to focus on implementing alternative configurations, such as Distributed Propulsion systems coupled with sustainable power sources. In this Student Thesis, the prospect of implementing a Distributed Electric Propulsion configuration powered by a liquid Hydrogen Fuel-Cell system on a small, commercial Light Sport Aircraft, specifically the Zodiac CH 650 B produced by Zenith Aircraft Company, is presented. The purpose is to present a thorough literature review regarding Distributed Propulsion and Electric Aviation while also providing the methodology of a structural analysis on the Zenith Zodiac CH 650 B, to be performed in the Diploma Thesis. The analytical method relies on strength of materials, lightweight structures and aerodynamic theory while the finite element method also requires designing and modeling the wing structure in CAD and FEA software respectively. The framework presented in this Student Thesis can be utilized and expanded in future Diploma Theses.

Keywords

Commercial Aircraft, Wing Structural Analysis, Distributed Electric Propulsion, Sustainable Aviation, Liquid Hydrogen Fuel-Cell