

Chumpon Suawnarttong, Flying Officer 2011: Topology Optimization RTAF6 Main Spar. Master of Engineering (Aerospace Engineering), Major Field: Aerospace Engineering, Department of Aerospace Engineering. Thesis Advisor: Squadron Leader Chamnan Pedchote, Ph.D. 75 pages.

One of many research and development project of RTAF was to design and build its own training aircraft. The RTAF has assigned this work to Directorate of Aeronautics. The project has been established and initially aimed to design and build a prototype in training aircraft. The aircraft was named RTAF-6, which was built by Reverse Engineering technique.

Several modifications were made during the design process. The important change was to increase the performance of the aircraft. This was achieved by installing a bigger-size engine. However this has a drawback of a heavier load to the aircraft. One way overcome this problem was to reduce the weight of other part of the aircraft structure, such that the total weight of the aircraft remained the same as the original one. This research pays attention to reduce weight from main spar of RTAF6. The web of main spar is plate-like. The target will be truss-like by using Topology optimization method. SIMP (Solid Isotropic Material with Peralization) is applied because this model want complicate mesh with a suitable volume fraction of void. This method is a way to find appropriate configuration of wing spar subjected by transversal force. The main wing spar RTAF6 was modeled by Solidworks and analyses with standard load for aviation. Then the model was simulated by Advance Finite Element Analysis until the weight of main wing spar is enough diminished but the strength remains as the original structure. Finally the weight was reduce 10%

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Student's signature

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Thesis Advisor's signature