

Case Study

How a Fortune 500 A&D company reduced excessive aircraft weight by optimizing the design of its wing spoiler



Design optimization for an aerospace and defense (A&D) company

Business Challenge

The customer is a global market leader in the supply of actuation systems providing primary and secondary flight control actuation systems for more than 75% of all wide and narrow body jet airliner programs, including all current Airbus models. The customer wanted a solution to optimize a wing spoiler to reduce excessive aircraft weight.

Mahindra Satyam's Role

To analytically minimize the structural weight of the spoiler, with and without the effect of wing bending; to understand the behavior of existing structure under various load cases and to achieve the same behavior for new structure at lower weight and weight optimization.

The initial design variables were 14, which finally culminated into 33 design variables. Hard

convergence was achieved for optimum solution using modified Steepest Decent Method and Sequential Quadratic programming.

In a comparative study between these methods, SQP was found better than Steepest Decent Method in reaching optimum solution.

Business Benefits

- Delivered 200% of target weight reduction of spoiler
- Optimized structure FE model in MSC/NASTRAN format
- Analytical optimization report in word format
- FE model with loads & BCs, Design constraints
- Stress, Displacement & Buckling

For further information please write to rfi@mahindrasatyam.net.