

Knowledge and Process Tools for Manufacturing of Affordable Composites- Rotary Wing Structures Technology Demonstration Program (RWSTD)

PROBLEM / OBJECTIVE

Helicopter program offices have placed a value on weight reduction of up to \$1M per pound, and 1,230 hours of recurring labor per helicopter. The objective of this demonstration program was to develop, mature and demonstrate technologies that will reduce the weight, manufacturing labor and non-recurring development cost for helicopter airframe structures by 15%, 26% and 39% respectively. This effort is part of the Knowledge and Process Tools for Manufacturing of Affordable Composites Manufacturing Technology Objective.

ACCOMPLISHMENTS / PAYOFF

Process Improvement:

This project developed one machine to perform X-Cor manufacturing functions. X-Cor is a reinforced foam structure which replaces traditional honeycomb at a weight savings of 10% and cost savings of 25%.

The new X-Cor structures have been baselined for several structures in Comanche with a plan to eventually replace nearly all of the honeycomb. Current structures are the main keel beam torque box, and forward fuselage bulkheads. The weight savings is 10%, accounting for the majority of the weight savings achieved to date, and the cost savings 24% over honeycomb structures.

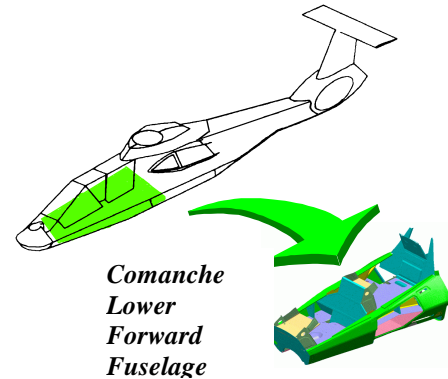
Implementation and Technology Transfer:

Comanche helicopter program office has committed to implement this technology. Electronic beam cured Comanche chine fairings are part of the EMD baseline design and are likely to be the first flight qualified parts using this process.

Additional implementation opportunities are being pursued with the Army UH-60 recapitalization program. The design tools are being utilized for advanced composite tailcone and folding stabilator that are now undergoing process trade studies.

Expected Benefits:

For the Comanche program, the RWSTD design tools have saved approximately 250,000 man-hours during EMD. Collective manufacturing labor hours avoided are



estimated to be 1,230 hours per aircraft, or at least \$27M over the life of the program. The weight reduction goals of this project will have the most significant impact. The weight metric for the Comanche lower forward fuselage is 15% (300 lbs to 254 lbs). Weight reduction goals are expected to be met or exceeded during Comanche implementation.

TIME LINE / MILESTONE

Start Date: March 1999

End Date: June 2001

FUNDING

Army ManTech: \$4.200M

Cost Sharing:

PM Comanche: \$2.600M

Sikorsky Aircraft \$4.000M (IR&D)

PARTICIPANTS

Alliant Tech Systems

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