

Low Cost Light Weight Structures

Develop and demonstrate improved manufacturing processes by supporting fabrication of rotary wing aircraft and secondary structures.

OBJECTIVE / SOLUTION

The objective of this ATO-M is to develop, demonstrate, and transition into production, new and improved manufacturing processes supporting fabrication of helicopter primary and secondary structures that offer the benefit of weight reduction and significantly reduce manufacturing costs. Primary emphasis will be: (1) demonstration of high performance light-weight materials, (2) development of low cost manufacturing processes, and (3) improved manufacturing yields. These tasks will take maximum advantage of processes and concepts that reduce the number of detail parts.



UH-60M Black Hawk Helicopter

Common Composite Tailcone for UH-60M Black Hawk Helicopter



Common Composite Tailcone for MH-60M Black Hawk Helicopter



CH-47 Chinook Helicopter Forward Pylon

ACHIEVEMENTS

Winner of the 2005 American Helicopter Society's Robert L. Pinckney Award "given in recognition of notable achievement in manufacturing research & development for rotorcraft components." This ATO-M is leveraging technology demonstrated under Research and Development programs, such as the Rotary Wing Structures Technology Demonstration (RWSTD) by applying lightweight material, and X-Cor™, to the UH-60 Black Hawk tailcone design. This will not only demonstrate advanced material but will result in substantial weight reduction for an advanced Common Composite Tailcone (CCT) design for UH/MH helicopters. The common composite tailcone design will also include paintless finish and composite drive shaft technologies.

BENEFITS

For the Common Composite Tailcone (CCT) unit:

- 20% recurring cost reduction from metal baseline
- 25% weight reduction for common design
- 70% reduction in part count and an 85% reduction in fastener count
- 90% reduction O&S costs.

For the CH-47 Chinook Helicopter Forward Pylon unit:

- 12% reduction in weight
- 67% reduction in fastener count
- 74% reduction in part count
- 42% reduction recurring costs
- Improved fit, durability, maintainability, water ingress, and commonality.

STATUS

Common Composite Tailcone (CCT):

- CCT design has been completed
- CCT baseline includes Common Missile Warning System (CMWS), Joint Tactical Radio Systems (JTRS), and Composite Tailrotor Driveshaft
- 6 ship sets of lightweight X-Cor™ have been delivered
- 2 test articles have been fabricated
- Teardown test in process.

Composite Tailrotor Drive Shaft (CTDS):

- CTDS design is in process
- A Braided Resin Transfer Molded (RTM) solution has been selected for drive shaft tubes.

CH-47 Forward Pylon:

- Project has been completed
- Project met or exceeded all goals including: cost, part count, and fastener count
- Composite pylon achieved an 11 lb. weight savings over the New Build program and a 31 lb. weight savings over the Salvage Modification program
- Submitted Forward Pylon Certification Plan to the Aviation Engineering Directorate (AED) for approval
- Boeing established internal project for "transition"
- Project included in SOW for first multi-year aircraft
- ARSS composite pylon will be on first multi-year A/C delivered January 2009.

WEAPON SYSTEMS / SECONDARY ITEMS IMPACTED

- CCT UH-60M and MH-60M Black Hawk FY08 implementation
- CH-47 Chinook F/G models Forward Pylon
- CH-47F Chinook model first multi-year aircraft delivery scheduled for January 2009 Implementation

POTENTIAL COST AVOIDANCE

- Potential cost avoidance of more than \$14,000,000.