

Low Cost Rotorcraft Cabin Floor Structure

PROBLEM / OBJECTIVE

Helicopters are weight and price sensitive. Excess weight translates into reduced mission duration, range, payload, and performance. The current UH-60M floor design is comprised of fiberglass skins with Nomex honeycomb core and numerous epoxy syntactic densification details and edge close outs. The floor is manufactured in a multi-step process that comprises manufacturing an inner composite skin, an outer skin, and a core blanket (splice and stabilized) as individual cured details and then assembling them into a final bonding operation. New technologies are available that can reduce weight and cost by replacing current structure and manufacturing processes with state of the art composite processes. The application of these new composite technologies can significantly reduce the weight of primary and secondary airframe structures while reducing the recurring cost and overall Operation and Support (O&S) cost.



Implementation and Technology Transfer:

The new cabin floors transitioned to PM Utility Helicopter in 4Q FY12.

These lower cost UH-60 Composite Cabin Floors will be ready to enter into a qualification test program funded by the utility helicopters project office. Insertion planning is for UH-60M Multi-year VIII following full qualification.

ACCOMPLISHMENTS / PAYOFF

Process Improvement:

This Army ManTech project demonstrated advanced manufacturing processes and technologies supporting fabrication of large composite helicopter cabin floors. This project reduced the labor-intensive multiple step manufacturing process which resulted in significant manufacturing labor and lead time reduction. The composite is an advanced sandwich structure that is lighter in weight than current metallic and non-metallic floor designs utilizing a simplified fabrication process that can be produced using Albany Engineered Composites K-Cor™ technology combined with composite face skin materials (such as carbon, fiberglass, quartz, etc.) depending on the weight, durability and cost constraints of the floor design.

In addition, the new K-Cor™ concept allows for more direct integration of floor features such as seat pans, cargo tie-downs, and densification for local attachments, thus resulting in a lower cost composite alternative.

The new cabin floor demonstrated a single step co-cured structure assembled from carbon facesheets and K-Cor™ sandwich core material. The use of these materials and manufacturing process demonstrated a lighter and less expensive final structure.

Expected Benefits and Warfighter Impact:

- Weight reduced by over 30 lbs.
- Cost reduced by \$15%
- Overall cost avoidance is projected at \$22M with a return on investment estimated at 4 to 1

TIME LINE / MILESTONE

Start Date	July 2007
End Date	Aug 2012

FUNDING

U.S. Army ManTech	\$6.7M
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PARTICIPANTS

U.S. Army Research, Development and Engineering Command (RDECOM) Aviation Research, Development and Engineering Center (AMRDEC)
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