



## Composite Main Rotor Blades: Summer 2017 *Innovation Update*

In the mid-2000's Erickson began making metal blades for the existing design after the supply of blades dried up. It proved to be a difficult exercise, even after Erickson brought the manufacturing completely in-house. After years of manufacturing metal blades, the commitment to design and build a composite blade was finally realized. Erickson partnered with another operator, HTS, to support the blade program. After much design and analysis by Erickson's engineers and industry experts, the prototype blade was manufactured by an external composites manufacturer. In 2015, Erickson built a composite manufacturing facility from scratch and brought the blade manufacture in-house.

"Erickson's composite main rotor blade program is the type of complex project typically done only at much larger manufacturers. Our work on the CMRB reflects a level of sophistication here at Erickson that the aerospace and manufacturing industries are becoming much more aware of now," said Billy Johnson, Director of Engineering for Erickson. The benefits of the new blades are expected to include improved hover performance, especially at hot and high conditions, lower fuel consumption, and a more reliable supply of blades that will be manufactured using the latest industry processes. Erickson is creating a state of the art, cost-effective, fuel efficient, low maintenance blade that will fit S-64 E & F and CH-54 A & B models.

Flight testing of the prototype composite main rotor blades continues, and important milestones have been achieved over the last several months.

**Completed S-64F Envelope Expansion:** The pilots and engineers slowly ramped up the duration and difficulty of flights in order to understand the impact of the blades on the aircraft and on its flight characteristics.

**Determined Control Load Solution:** In order to ensure the control system loads were ideal, the trim tabs on all 6 blades had to be fine-tuned many times, and the flight test results were analyzed thoroughly before coming up with their final position.

**Completed S-64F Strain Survey:** Flight strain testing (with metal blades first, then composite blades) provided structural and aerodynamic load data for the new blades and a comparison to the existing blades.

**Lab Testing:** Off-aircraft lab testing already underway includes Safety of Flight fatigue tests and lightning strike tests to prove out the structural capability and durability of the new blades. In the coming weeks we will start the E sleeve fatigue tests and the blade certification fatigue tests.

**S-64E:** S-64E baseline strain testing (metal blades) began in May, with composite blade envelope expansion and strain testing to follow in the summer. Performance testing will take place in late summer/early fall.



*Amanda Hammerschmith, Blade Program Manager, with a blade spar.*

### CONTACT

**Scott Ellis**

manu&mro@ericksoninc.com

503.705.0194s

5550 SW Macadam Avenue, Suite 200  
Portland, OR 97239 USA

**ERICKSONINC.COM**