



G A L O R A T H

Using SEER[®] to Model the Cost of Bell Helicopter's 505 Jet Ranger X



Background

In 2012, Bell Helicopter was faced with the challenge of designing a new-generation replacement for its long-established lightweight workhorse Bell 206 B3, and producing it at a cost that would make it competitive in today's market.

Challenges

The challenge itself was twofold – to design a helicopter that was technically competitive, and to produce it at a cost that would allow Bell to regain its dominant position in the short light single helicopter market.

The original Bell 206 was designed in 1962, and later versions, including the 206 B3, were largely the result of incremental improvements in the basic 206 design. For this reason, Bell decided that the 206 B3's successor would be designed from scratch, retaining only the rotor system and a few other dynamic components from the 206 B3.

The result of this clean sheet design effort was the Bell 505 Jet Ranger X (JRX), a technologically modern, high-performance light helicopter which, while slightly larger than the 206 B3, serves as a worthy replacement to the 206 family of vertical lift aircraft. And, although the Bell 505 JRX makes extensive use of composite materials and includes a fully integrated glass flight deck along with other advanced features, it lists at a price that is a greater than 50% reduction compared to its predecessor.

The Solution

How did Bell manage to do this? They used SEER for Hardware and SEER for Manufacturing - Aerostructures to model and track costs throughout the design process, in order to maximize performance while minimizing both design and final production costs. The decision to use SEER cost estimation software came early, during the inception phase of the project. This allowed project managers to understand and control costs throughout the development process.

"SEER enables detailed discussions on cost reduction options with an actual cause and effect relationship. **No tool we have worked with has been nearly as effective as SEER.**"

David Smith, Program Manager

Faster Estimating, Improved Productivity and Early Visibility of Critical Business Decisions

- **SEER was crucial in performing trade studies, allowing the project team to clearly understand how specific design decisions would affect costs.** According to Javier Provencio, a Bell Helicopter Cost Analyst, Commercial Ships Management, "We were able to understand the cost implications of design alternatives at every point in the development cycle."
- **The Jet Ranger X design team used SEER iteratively, repeatedly remodeling systems as design decisions were made.** SEER's rapid redesign/remodel cycle provided instant feedback, allowing the design team to make informed on-the-spot decisions. If they had attempted to use the same process without SEER, it would have been prohibitively slow.
- **SEER enabled the design team to go beyond the traditional cost/hours per unit of weight metrics,** using an extensive set of sophisticated, parametrically-modeled cost drivers, which included improvements in technology, percentage of new design, economic factors such as rates for specific engineering and manufacturing labor roles, and production quantity and schedule.
- **SEER gave Bell procurement managers a clear understanding of the material requirements of the project, allowing them to take a long-term, fact-based strategic approach to organizing the Bell 505 JRX production supply chain.** Bell 505 JRX Strategic Procurement Manager Matthew Duke explains, "SEER has provided us a factual foundation on which we can engage in negotiations. It provides a level of knowledge and confidence that allows us to have better and more productive conversations with our potential suppliers."

Result

By now the Bell 505 JRX is well on its way to becoming a major factor in the global light rotorcraft market. Its carrying capacity, range, maneuverability, advanced avionics features, and price make the Bell 505 JRX an obvious first choice in such diverse fields as law enforcement, search and rescue, energy exploration, executive transport, and traffic reporting. And SEER is a key element in the Bell 505 JRX success story; SEER's comprehensive cost model and rapid feedback made it possible for Bell Helicopter to produce the Bell 505 JRX at a highly competitive price without sacrificing design or production quality.