

Tech focus

This month features some of the technological highlights from the Aerospace Congress & Exhibition that took place in September.

Defense challenges: Funding, development cycles, etc.

Aging populations across the globe are forcing governments to increase spending on social programs and decrease it on defense. It's a situation that requires both new thinking and approaches to defense, according to Glenn Weissinger, Senior Manager—Environment and Valuation Assessment, **Lockheed Martin**.

Weissinger was one of four Wednesday-morning panelists addressing the theme, "Defense and Homeland Security: the New Reality." The new reality, in his view, puts a premium on affordability of new aircraft and defense systems. Cost efficiencies can be achieved in three major areas: manufacturing, development cycle time, and integrated capability solutions.

The military aircraft development cycle times of today—exceeding 20 years in some cases, and by the year 2020, about 75 years if current trends aren't reversed—has a negative effect on engineering capability because few engineers have the experience of seeing

a program through from start to finish. The transfer of program development knowledge skills is thus a "significant challenge," said Weissinger.

As for integrated capability designs, he said the goal in the past has been 100% improvement in capability for any particular aircraft platform. The new reality (defined to a large extent by terrorism) requires that instead of optimization at the platform level, it be sought at the overall military level including all branches. This shift means foregoing the idea of having a "most capable aircraft," Weissinger said, which could cause the lines to blur between what are now specific types of aircraft, such as fighters and bombers.

The new reality goes beyond an integrated approach by individual nations to an integrated approach among nations. In his presentation, C.T. Burbage, Executive Vice President and General Manager—Joint Strike Fighter Program, Lockheed Martin Aeronautics,



The importance of coalitions was driven home by several speakers at a panel session on homeland security and defense, and featuring representatives from Lockheed Martin, International Air Transport Association, and EADS North America.

noted that the Joint Strike Fighter is being developed from the ground up for countries to use as part of a national defense structure and for use in joint operations by coalitions.

Patrick Ponticel

Supersonic business jet

Several programs have been initiated to study the possibility of a new generation of commercial supersonic aircraft, among them the SCAR program in the 1970s and the HSCT program in the mid 1990s, both led by **NASA** and both proving unsuccessful. The studies did, however, expose the extreme sensitivity of commercial supersonic travel to both weight and economics, which has shifted the focus of the quest for a new generation of commercial supersonic vehicles to supersonic business jets because they are lighter and less sensitive to economic metrics when compared to larger commercial aircraft.

Market studies indicate that there is an adequate demand for supersonic business jets, even when considering their high projected cost. **DARPA** launched the Quiet Supersonic

Aerospace Systems Design Laboratory created an integrated computer environment toward the exploration of the design space for a supersonic business jet.



Platform project in 2000 in an effort to design a feasible supersonic jet leading to a military derivative. Working with **Northrop Grumman** and **Lockheed Martin**, the project is currently in Phase II.

To address the issue of a supersonic business jet, researchers at **Aerospace Systems Design Laboratory**, part of

Georgia Institute of Technology, created an integrated computer environment (ICE) to rapidly analyze varying configurations of the jet.

The experiment was conducted within a specific design space, using response surface equations. Advanced technologies that decrease the sonic boom, noise, and emissions—in addition to affecting other metrics—were applied to a baseline