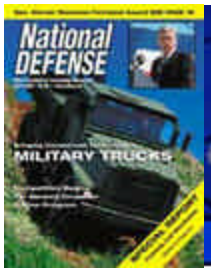

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Feature Article

Navy Seeks Balance Between Simulator and Flight Training

by Stephen Willingham

Future U.S. Navy investments in training programs must focus on the integration of real flying, live-firing exercises and simulators, according to service officials. Such integration is important, these officials asserted, because of the new emphasis in U.S. warfare doctrine on precision bombing and computer network-based technologies.

Navy Capt. Rory Fisher, PMA 205 program manager, said that the primary challenge for the Navy is to provide enough funding to meet training needs for both existing, legacy systems, and for new programs such as the new fighter/bomber, the F/A-18 E/F.

Fisher and other officials addressed a recent symposium in Alexandria, Va., sponsored by the National Training Systems Association and the U.S. Naval Air Systems Command Training Systems Program Office, known as PMA 205.

According to Fisher, the last thing aviators want to see is a decline in live flight hours in order to be able to afford simulators. But he acknowledged that when budgets are cut, training and logistics generally are vulnerable accounts. "We don't ever want to find ourselves in a situation where we have F-18s with an insufficient number of trainers and simulators."

"When it comes down to a choice between parts for planes or simulators," said Cmdr. Bob Finlayson, F/A-18 assistant program manager, "guess which is going to win?" Spare parts always will be more important, he said.

Finlayson estimated that the Navy aviation program will need $1 billion over the next 10 years dedicated to training across the spectrum-not only for aircrews but also for operational and maintenance personnel.

In a speech at the conference, Rear Adm. Mark Gemmill, who heads aviation manpower and training programs for Navy operations, warned that training should not be sacrificed in order to support new weapons systems. Gemmill emphasized the importance of live training.

Simulators, he said, fit naturally into his plan by helping to provide "a continuum," that runs through training, to actual flight and then combat missions. "We have to hit the right target, at the right time, with the right ordnance," he said.

"With the specifics involved in precision bombing, a simulator becomes even more important," said Dave Bartlett, a retired Marine aviator, now a marketing manager for computer maker SGI, in Chantilly, Va.

For that reason, Bartlett maintains that the military services must rise above the old argument of simulator vs. live flying. Continuing to promote one as more important than the other is counter-productive, he said, and slows down efforts to integrate the two.

Bartlett did not claim that simulation could replace real flying. "We will still have to have flight time," he said. However, "with the specifics involved with precision bombing, a simulator becomes even more important. You can never replace real flight time, but skills can be greatly increased in a simulator."

Integrated Training

For Gemmill, the key to success is program integration-where the lessons learned in the simulator are transferred automatically to the cockpit. One of the main problems Navy officials encounter, he said, is not having simulators that are equipped with current technology, comparable to the aircraft that aircrews are training to fly. He said that, often, crews are using outdated simulations.

"Just because it works doesn't mean it's right," Gemmill continued. "Once again, your technology must be current and made to work for people who are involved."

Findlayson stressed that the Navy needs to replace its "antiquated training systems." One priority, he said, is two-seat trainers. "If we don't fly with a single seat, then why should we have to train that way?"

Because of the expense associated with flying and with firing precision munitions, Gemmill said, training needs to achieve a "seamless mix" between simulation, real flight and live fire. "You don't have to drop live precision munitions to know how to do it," he said. "The expense of the ordnance and the size of the range will continue to dictate [how training is accomplished]."

The ideal situation, Gemmill says, would be an increase in flight time, in combination with simulator flying. The recent moratorium on live fire training at the Navy range on Vieques Island near Puerto Rico, Gemmill said, creates all the more urgency for a seamless transition from the simulator to the cockpit.

Capt. Robert "Buddha" Snyder, the head of aviation training resources for Navy operations, expressed concerns that shortfalls in training will affect naval force readiness.

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Non-deployed air wing readiness is a problem, he said, because most of the training resources are devoted to "those who are going to be deployed."

This trend causes what he referred to as the "bathtub effect." The bathtub effect is a precipitous dip, which occurs between a high point of readiness and when a deployed squadron returns to home base once their assignment is completed. When charted on a graph, the low point that occurs between the two creates what Snyder referred to as a bathtub.

"There should be a standard readiness profile," he said. "Just because I can go out and drop a bomb and hit the ground somewhere, what have I proved?"

Snyder asked. "At least with a simulator, an instructor can grade me on performance. It's also cheaper," he added.

Snyder said that, when it comes to cost, simulators get the best return on investment. "Go ahead and fly what you have, but also use simulators."

Proficiency in firing precision bombs, said Snyder, can be refined on a simulator quite effectively. Once an aviator climbs into the airplane, he said, pilots should have a feeling of déjà vu.

"There's still no substitute for flight time," he said. "There needs to be a blend between simulator time and flight time."

Simulators have improved to the point, he says, where approximately 25 out of possible 40 events can be rehearsed in the simulator. And that number is growing. But, said Fisher, technologies such as web-based training-which would allow for more networking between simulators-and embedded training are not getting adequate funding. Budgets for simulation upgrades and training seem to be the most vulnerable when cuts are made, he said.

Embedded trainers are built as part of the weapon platform.

Embedded training systems combined with advanced distributed learning (ADL) offer the ability to train while on the way to a deployment, said Cmdr. Rick McQueen, a PMA 205 official who is working on the Joint Strike Fighter (JSF).

The JSF will have three variants-for the Air Force, the Navy and the Marine Corps-but all three will have a large percentage of common components. For that reason, McQueen believes the JSF will go a long way toward solving compatibility problems in simulation, modeling and training. "Improved commonality enhances continuous training," he said. In the JSF program, "we will use a virtual-strike warfare environment that will incorporate simulation and modeling."

Fisher noted that, despite the advances planned for the future, the Navy

remains equipped largely with outdated technology. "Most home computers are more capable than PCs in the fleet."

He wants to see all courseware become web-based. "We have to control software, specifically courseware structure so that we can get ready for ADL." Under the ADL vision, sailors would be able to take their courses anywhere, even while deployed, and at any time of the day or night.

"We need to prioritize education. There needs to be value-added learning to foster trust between the different levels where people are doing their jobs," Fisher said. This would help improve interaction between air, maintenance support crews and industry.

Lack of Trust' Hampers Management of Defense Contracts

A U.S. Navy official in charge of training programs recently asked industry representatives to assist the service in ironing out problems that stem from "lack of trust" between contractors and customers. He also chided contractors for underestimating costs early in a program, thus causing cost overruns later in the project.

"When we sign a contract between government and industry we still have problems with costs and definition requirements," said Navy Capt. Rory Fisher, program manager at the U.S. Naval Air Systems Command Training Systems Program Office (PMA 205).

He spoke at a conference in Alexandria, Va., sponsored by PMA 205 and the National Training Systems Association.

The government, said Fisher, currently lacks "insight into all levels of research, development and production." The result is "unexpected surprises" in the form of cost overruns, explained Fisher. One problem, he complained, is that "there's no provision for government insight into subcontractors."

Fisher asked rhetorically, "How do we arrive at a level of trust with all the legal and contractual issues that exist out there?"

He would like to see a system of "fixed-priced incentives" in order to avoid project overruns-which are paid for by the government. In a fixed-priced arrangement, Fisher would include an incentive reward if the contractor meets cost and delivery requirements. He said that he is "sick and tired" of seeing cost overruns that often are caused by ineffective estimating procedures.

The problem lies in competing interests of government and industry, says Lt. Cmdr. Randy Dornan, assistant program manager for the Joint Primary Trainer System (JPATS). "Industry is profit driven and government is product driven."

Dornan summarized the situation: "Government gives industry the money to do the job and industry is driven by profit and obligation to the stockholders. What we get [as a result] is called a management challenge."

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Ideally, said Dornan, there should be an arrangement where program managers would be involved at all levels of research, development, testing and manufacturing. "You can't do it without input from the people who expect the product," he told the conference.

Government program managers need to be able to track their programs down to the smallest details, said Lari Manning, a Navy training project leader. "This way the government obtains what it wants instead of ending up at the end of the process needing to put in more money and no one is happy with the end result."