Getting it Right with the CV-22

MAJ Scott A. Schaeffler, USAF

Student, United States Army Command and General Staff College

1 Jun 1998

> "Usually everybody starts even and everybody starts wrong…the advantage goes to the side which can most quickly adjust itself to the new and unfamiliar environment and learn from its mistakes." [1]
>
> —Michael Howard

Introduction

One of the great military historians of this century, Professor Michael Howard, argues that military institutions will never "get it right" in peacetime. Our doctrine, he claims, is left to "sail on in a fog of peace" until land is sighted and we learn if our calculations have brought us into a navigable cove or crashing onto a rocky shore.[2] An example of this is Hitler's failed attempt to establish air superiority over England in 1940—the result of a fruitless strategic bombing campaign waged with an unsuitable force of short-range dive bombers.

The key to overcoming such inevitable failures in our planning, Howard continues, lies in our capacity to adapt: "…flexibility both in the minds of the Armed Forces and in their organization…needs above all to be developed in peacetime." This flexibility was evident in England's response to Hitler's plan: the late-term mobilization of British fighter aircraft production which led to victory during the Battle of Britain.[3]

This concept of "futile preparation--meaningful adaptation" prompts an important question: Are we getting it right today? Are the machines we've produced and the doctrine governing their use leading us to navigable waters or rocky shores? Have we built-in the capacity to adapt? Among modern day weapons systems, none has been questioned more than our current acquisition of the CV-22 Osprey tiltrotor. Boasting both revolutionary technology and the potential for strategic-level roles with tremendous political ramifications, Special Operations Command's (SOCOM's) Osprey is perceived by many as the epitome of uncertainty—poised for glorious vindication or utter failure in the span of one critical mission. However, built with a treasure of experience by a major command (MACOM) that is always at war, the CV-22 may indeed "get it right"! Far outpacing anything in our current inventory, the CV-22 is the only choice for a MACOM that has recently established its presence among the suitors of our nation's strategic-level missions.

New Technology

> "During the twentieth century…none of the most important devices that have transformed war--from the tank…through the

> atom bomb--owed its origins to a doctrinal requirement laid down by people in uniform…"[4]
>
> --Historian Martin Van Creveld

Howard warned of the fate awaiting those who build doctrine upon technological change: "…we cannot escape looking as foolish in the eyes of posterity as our fathers and grandfathers do in ours…"[5] The problems of such innovation can only be solved by "rigorous operational analysis" and experience. American military history is replete with attempts to fit new technology into old tenets of war—the tank in World War I; the aircraft carrier in World War II.[6] Fortunately, the V-22 represents a solid break with the failure of doctrine built on technology. It symbolizes a far more solid concept—one of technology built on doctrine…and doctrine built on experience!

Experience. "We've had a requirement for an aircraft such as the CV-22 since the failure of the Iran embassy rescue 16 years ago," says Lt. Col. James Teeple, CV-22 command program manager at Air Force Special Operations Command (AFSOC). Due to the limitations of the C-130s and helicopters, the rescue plan would have taken three nights to complete. By today's special operations forces standards, that would have violated the maxim for covert operations: get in and out fast without being detected. "If the CV-22 had been available, rescuers could have completed the mission in one night."[7]

Similarly, during noncombatant evacuation operations in Liberia in 1996, the Air Force Special Operations Command learned of the value of self-deployability. Liberia was carried out with five MH-53Js, four MH-47s, three HC-130s, two MC-130s, and two C-130s supported by sixteen C-5 and C-17 sorties. According to AFSOC, the same operation could be accomplished much faster in the future using only five CV-22s, three HC-130s, and one C-17.[8]

The surprising resistance encountered by Task Force Ranger at the Battle of Mogadishu in 1993 further emphasized the inherent advantage of conducting special operations missions under the cover of darkness.

Doctrine. The doctrinal requirements resulting from these and a multitude of other "rigorous operational" experiences are strongly amplified on page 1 of the Operational Requirements Document (ORD) that drives the CV-22 acquisition program:

> "…a high-speed, long-range, VTOL aircraft capable of penetrating politically or militarily denied areas in adverse weather, using terrain following/terrain avoidance radar for the purpose of infiltration, exfiltration or resupply…it will self-deploy worldwide without aerial refueling in order to maximize mission security…[and will] possess the speed sufficient to complete most national mission taskings within one period of darkness…"[9]

The proliferation of advanced, lethal weaponry on even the most austere of modern battlefields has made the qualities of speed and surprise critical waypoints on the route to success. The authors of the ORD recognized these most basic components of SOF tactical doctrine: "…the

primary tactic of the aircrews is to avoid detection…SOF missions require extreme precision to insure the element of surprise…"[10] William McRaven, a Navy Seal and author of Case Studies in Special Operations Warfare, discovered the importance of speed and surprise while analyzing the results of a broad array of SOF missions executed during this century:

> "Surprise is essential, but it should not be viewed in isolation…over time the frictions of war work only against the special operations forces and not against the enemy. It is essential, therefore, to move as quickly as possible regardless of the enemy's reaction."[11]

Technology--Capability. Given the aforementioned experiences and the resultant doctrine the question remains: Does the CV-22 "fill the billet"? A quick review of its raw capabilities seems to provide an answer. The Osprey can cruise twice as fast (250 knots vs 120) and more than twice as far (unrefueled combat radius of 500+ nautical miles vs about 200) as the MH-53J Pavelow helicopter it is replacing[12]. It is also capable of flying at altitudes up to 25,000 ft--once again, twice the service ceiling of the Pavelow.[13] Tests conducted on the Bell XV-15, a concept demonstrator tiltrotor, revealed that the noise level of a tiltrotor in a hover is lower than that of a comparably sized hovering helicopter. In airplane mode, the tilrotor's noise level decreases further due to the reduction in rotor tip speeds.[14] Finally, a cost and operational analysis conducted in 1993 by the Center for Naval Analyses determined that the combat survivability of the CV-22 was three and a half times greater than that of the H-53 series helicopter. The H-53's greater payload capacity only exacerbated the impact of its expected combat losses![15]

Technology—Impact. Though some studies have shown helicopters such as the Pavelow to be more payload efficient for a radius of action up to 200 nautical miles, SOF missions have more often required a far deeper penetration capability. The CV-22's tremendous advantage in range and speed allow it to provide support for SOF forces from more distant bases with far less dependence on forward logistics. The all too common requirement for cargo transload areas in enemy territory will be eliminated. This inevitably means moving fewer soldiers into "bad-guy-country"—further enhancing operations security while at the same time increasing force protection. This range/speed combo also promises to cut in half the exposure time of SOF warriors to enemy air defense systems during the ingress and egress portions of a penetration mission. The tiltrotor's self-deployment capability (up to 2100 nautical miles with one aerial refuel) eliminates the time-robbing requirement to break down the aircraft so that it can be airlifted aboard one of our scarce C-5 or C-17 aircraft into theater —where it must be built up again (12-hour process). The Osprey's ability to fly high effectively doubles the aircrew's options when confronted with adverse weather conditions or enemy anti-aircraft artillery. Climbing over such obstacles is rarely an option for the Pavelow! In summary, the CV-22 will provide the best protection available for the American soldiers on board as they fly into harm's way.[16]

However… Obviously, any new design that so ambitiously seeks to combine the capabilities of two dissimilar aircraft is certain to have shortcomings. For example, the Osprey's advantage in speed goes away during its transition to hover mode at the objective. History shows, unfortunately, that over half of the helicopters lost in combat have been destroyed in the terminal

phase of an assault.[17] The introduction of the Osprey will also create a sudden mismatch with existing support aircraft. Relying on helicopters to provide armed escort or on-scene fire support will no longer be feasible. (Perhaps AC-130 gunships or an attack version of the V-22 will fill this role.) Payload considerations have also been a sore point with the CV-22. Planners will have to take into consideration its reduced cabin volume and lift capacity. Not only does it carry fewer troops (18 vs 27), it is also incapable of transporting any of the armored, wheeled vehicles currently used by SOF teams. Procurement of a new vehicle is still pending.[18] On a higher note, the ability to carry fewer troops may reverse the current, distrurbing trend to lift as many people as possible into the fight—an idea at odds with McRaven's assertion that relative superiority in special operations favors small forces. "At some point, the span of command and control becomes too great for a large force to effectively blend the principles of special operations."[19]

In spite of these current deficiencies, the fact remains: If we could find a tank, or a fighter, or a soldier that was twice as fast, went twice as far, flew twice as high, and was 3 ½ times as survivable as anything in our current stock—we'd buy it!

Political Ramifications & Costs

Michael Howard brought his theme of "getting it right" into the political arena as well:

> "…the social changes of our time may so transform the whole nature of warfare that the mode of thought of the military professional today will be, at best, inadequate, or at worst, irrelevant. This is the kind of change for which we must today be prepared and able, if necessary, to adjust."[20]

This "social change" is already upon us. In a 1990 article for Military Technology, Marvin Liebstone noted that low-intensity conflicts were likely to become the future main threat and that the CV-22 "is suited for threats that will exist long after the NATO/Warsaw Pact European scenario dwindles."[21]

Unfortunately, the Osprey's initial acquisition hit rocky ground in the late 1980's when Secretary of Defense Richard Cheney cancelled the program in lieu of weapons systems (B-2 Bomber, F-22 Fighter, Army's LHX) that crowded out all other competition for DOD dollars at the strategic level. Since then, however, most remnants of the narrow focus of our cold war national strategy have more or less disappeared. Like its avian cousin the Phoenix, Osprey has since arisen from the ashes of the FY 1991 Budget Plan to claim a seat at the strategic table. Major George Trautman summed up the intrinsic value of the tiltrotor in Can the Osprey Survive in Combat: "If the [CV-22] fills a void in our strategic arsenal, then its estimated value to the nation must be increased commensurate with its effectiveness in that role."[22]

SOCOM's principle missions of counterproliferation, counterterrorism, and foreign internal defense (among others) now establish SOF's direct linkage to the United States' security strategy.[23] This union between SOF targets and national security objectives serves to firmly entrench the people and weapons of SOCOM at the strategic level of warfare. The Osprey's ability to rapidly self-deploy, air-refuel enroute and then land without regard to the availability of

a runway make it the only national asset truly capable of accomplishing the aforementioned mission roles. If cost were the only concern, we would quickly succumb to the "attractive irrelevance" of purchasing something that simply does not fulfill the requirements. The President of Bell Textron Helicopter, Leonard Horner, said it best: "Defense is not an economical business…[it] is there to make sure we are defended."[24]

Conclusion

"Getting it Right" in peacetime is never an issue for a force that is always at war. The doctrine and weapons of SOCOM are continually tested by experience. As a result, SOF commanders are imbued with the boldness required to execute high-risk strategic missions. Ten years ago, the MH-53J Pavelow helicopter was a reasonable adaptation to these dangerous SOF mission requirements. Today, our experience consistently points to the tiltrotor as the right answer…the best answer offered by today's technology!

The key now is to "quickly adjust". We must focus on fixing what went wrong during the acquisition process: a wheeled vehicle; an escort platform; customer requirements. Transforming these discrepancies into temporary shortfalls is the essence of Howard's "capacity to adapt".

NOTES

1. Michael Howard, "Military Science in an Age of Peace," RUSI, Journal of the Royal United Services Institute for Defense Studies 119 (March 1974); reprinted in US Army Command and General Staff College, C610 Syllabus/Book of Readings, (Fort Leavenworth: USACGSC, August 1997), p. 27.
2. Howard, p. 25.
3. Department of the Army, US Army Command and General Staff College, A856, Theater Air: Modern Case Studies in Military Campaign Planning and Execution (Fort Leavenworth: USACGSC, No Date), pp. 4, 13.
4. Martin Van Creveld, Technology and War (New York: The Free Press, 1989), p. 220.
5. Howard, p. 28.
6. James D Hildreth, War with the Osprey: Technology and the Limits of Vision in Warfare (Newport, RI: Naval War College, 17 June 94), p. 17.
7. Merrie Schilter Lowe, "CV-22 to Fill the Void." Air Force News Service [Online] Available http://www.af.mil/news/Jun1996/n19960607_960547.html, June 1996.
8. Glenn W. Goodman, Jr., "Deep Penetrator." Armed Forces Journal International (November 1997), p. 44.
9. United States Special Operations Command (USSOCOM), Operational Requirements Document for the Joint Multi-Mission Vertical Lift Aircraft (MacDill AFB, FL: USSOCOM, 3 Nov 94), p. 1.
10. Ibid., p. 29.
11. William H McRaven, Case Studies in Special Operations Warfare: Theory and Practice. (Novato, CA: Presidio Press, 1995), p. 19.
12. According to Glenn Goodman in his article "Deep Penetrator," AFSOC plans to replace all of its helicopters (40 MH-53J Pave Lows and 10 MH-60G Pave Hawks) and MC-130E Talon I aircraft (14) as well as 18 of its 28 MC-130P tankers with the Osprey. In

this respect, AFSOC considers its acquisition of 50 CV-22s to be much more of a force structure replacement than simply an aircraft replacement. (From conversation with Maj Richard Herr, AFSOC Assistant Chief of Rotary Wing Programs.)

13. Bell Helicopter Textron, "Bell Boeing V-22 Osprey." [Online] Available http://www.bellhelicopter.textron.com/lowrez/pd/tr/v22.html, January 27, 1998.
14. Brian A. Maher, The JVX Aircraft in Low Intensity Conflict (Maxwell AFB, AL: Air Command and Staff College, April 1984), p. 45.
15. Timothy G. Hanifen, "V-22 Osprey: There Is No Alterative." Marine Corps Gazette (May 1995), p. 34.
16. Ibid., p. 35.
17. George J. Trautman, III, Can the Osprey Survive in Combat? (Newport, RI: Naval War College, February 16, 1988), p. 24.
18. Glenn W Goodman Jr., "Deep Penetrator." Armed Forces Journal International (November 1997)
19. McRaven, pp. 8-9.
20. Howard, p. 29.
21. Marvin Liebstone, "V-22 Osprey: Yes or No?" Military Technology (August 1990), p. 99.
22. Trautman, p. 15.
23. Joint Special Operations Forces Institute, Special Operations forces Reference Manual (Draft) (Ft Bragg, NC: JSOFI, June 1997), p. 1-3.
24. Benjamin F. Schemmer, "From the Boardroom: Leonard M. Horner—President, Bell Helicopter Textron.." Armed Forces Journal International (May 1990), p. 66.

BIBLIOGRAPHY

Bell, Billy C.. Marine Aviation and Operational Maneuver from the Sea. Newport, RI: Naval War College, June 13, 1997.

Bell Helicopter Textron, "Bell Boeing V-22 Osprey." [Online] Available http://www.bellhelicopter.textron.com/lowrez/pd/tr/v22.html. January 27, 1998.

Bowden, Mark. "Blackhawk Down." The Philadelphia Inquirer. November 16, 1997. Also available online at http://www3.phillynews.com/packages/somalia/sitemap.asp.

Briand, Daniel. A Methodology for Making the SOF Aircraft Deployment/Employment Decision. Wright-Patterson AFB, OH: Air Force Institute of Technology, March 1987.

Flanagan, Robert M. "The V-22 Is Slipping Away." U.S. Naval Institute Proceedings. August 1990.

Goodman, Glenn W., Jr. "Deep Penetrator." Armed Forces Journal International. November 1997.

Goodman, Glenn W. Jr. "Lift On Arrival: New V-22 Tilt-Rotor Aircraft Lacks A Compatible Ground Vehicle." Armed Forces Journal International. December 1997.

Hanifen, Timothy G. "V-22 Osprey: There Is No Alterative." Marine Corps Gazette. May 1995.

Hildreth, James D.. War with the Osprey: Technology and the Limits of Vision in Warfare. Newport RI: Naval War College, 17 June 94.

Hinote, Paul. What Do We Do with the V-22? Maxwell AFB, AL: Air Command and Staff College, April 1987.

Howard, Michael. "Military Science in an Age of Peace." RUSI, Journal of the Royal United Services Institute for Defense Studies 119 (March 1974): 3-9. Reprinted in US Army Command and General Staff College, C610 Syllabus/Book of Readings, 24-30. Fort Leavenworth: USACGSC, August 1997.

Joint Special Operations Forces Institute. Special Operations forces Reference Manual (Draft). Ft Bragg, NC: JSOFI, June 1997.

Liebstone, Marvin. "V-22 Osprey: Yes or No?" Military Technology. August 1990.

Lowe, Merrie Schilter. "CV-22 to Fill the Void." Air Force News Service. [Online] http://www.af.mil/news/Jun1996/n19960607_960547.html. June 1996.

Maher, Brian A.. The JVX Aircraft in Low Intensity Conflict. Maxwell AFB, AL: Air Command and Staff College, April 1984.

McRaven, William H. Case Studies in Special Operations Warfare: Theory and Practice. Novato, CA: Presidio Press, 1995.

Round, Commander William H.. V-22: Dual-Use Technology or Red Herring? Washington, D.C.: The Industrial College of the Armed Forces, April 1993.

Schemmer, Benjamin F. "From the Boardroom: Leonard M. Horner—President, Bell Helicopter Textron." Armed Forces Journal International. May 1990.

Trautman, George J., III. Can the Osprey Survive in Combat? Newport RI: Naval War College, February 16,1988.

U.S., Department of the Army, US Army Command and General Staff College. A856, Theater Air: Modern Case Studies in Military Campaign Planning and Execution. Fort Leavenworth: USACGSC, No Date.

United States Special Operations Command. Operational Requirements Document for the Joint Multi-Mission Vertical Lift Aircraft. MacDill AFB, FL: USSOCOM, November 3, 1994.

Van Creveld, Martin. Technology and War. New York: The Free Press, 1989