vertiflite Commentary

September 11th – 10 Years On

By Mike Hirschberg, Executive Director

Ten years later, the images of September 11, 2001 are still seared into the consciousness of the United States and much of the world. But in addition to the nearly 3,000 lives lost on that day are the 6,000 Americans and hundreds of allied warfighters killed in Afghanistan and Iraq in prosecuting the Global War on Terror. Through it all, we have witnessed the incredible capabilities of vertical flight and the potential that is still not fully tapped.

On the fateful morning of September 11th, rotorcraft could have saved scores or hundreds of trapped World Trade Center workers – four police helicopters flew to the burning buildings, searching for survivors on the roof. One of the pilots had rescued 28 people during the 1993 World Trade Center bombing. But this time, the roof doors were locked. Notably, Los Angeles and other southern California jurisdictions require helipads on tall buildings; the LA fire department has used its rescue helicopters to save lives several times since the mid-1980s. But the Department of Homeland Security and other government bureaucracies have still not embraced the full potential that rotorcraft could provide in disaster relief. Even the incredible ad hoc rescues performed during Hurricane Katrina in 2005 failed to result in more comprehensive government planning. Why?

In Afghanistan, the first operatives were inserted by helicopter less than two weeks after the September 11th attacks. For 10 years, vertical lift aircraft have been the workhorses of the war effort. In May 2008, then-Secretary of Defense Robert Gates wrote to Congress, stating "DoD vertical lift capabilities have been a key component in our success in the Global War on Terror, particularly in Iraq and Afghanistan."

According to the 2009 *Study on Rotorcraft Survivability* (presented at Forum 66), US military rotary wing assets had accrued over three million flight hours in Afghanistan and Iraq through September 2009 (four times what fighters and bombers had flown), plus another 8 million flight hours in the rest of the world. Yet this study pointed out the shortcomings as well – the tremendous cost in lives and aircraft lost, which as of this writing, stands at 583 Americans and 407 aircraft. The Survivability Study's findings pointed out that more than 80% of losses through 2009 were not due to hostile action, but rather from non-hostile causes such as controlled flight into terrain (CFIT), brownout, object/wire strike and engine failure – events that more advanced technologies could have prevented.

The September 11th attacks instigated in a decade of unparalleled contributions by rotorcraft to national strategy objectives, but more investments in technology are still needed. (US Army photo via The Pentagram*)*

Current conflicts clearly demonstrate the essential role of vertical flight in achieving military objectives. But the extraordinary operations tempo and extreme environments were not envisioned when today's vertical lift aircraft were conceived. Shortfalls in performance, maintainability, survivability, situational awareness and affordability are becoming increasingly pronounced. Significant advancements in these areas are essential if rotorcraft are to be able to continue to support current and future operations effectively, particularly if future adversaries are more technologically advanced.

The tail section is all that remained intact after the demolition of a modified Black Hawk that crashed in the raid to eliminate Osama Bin Laden. (Reuters/Stringer photo)

Two recent events in Afghanistan typify the operational use of vertical flight aircraft over the past ten years. The first is the mission that led to the elimination of Osama bin Laden; the second, the shootdown of a Chinook with an RPG.

The raid on bin Laden was a welcome end to a specter that had haunted the national psyche for most of the decade. Only vertical flight aircraft could have infiltrated Pakistan, identified and neutralized bin Laden, and returned with a treasure trove of seized materials. Although the public may have been stunned by the daring of the successful raid, it was only a single case of vertical flight fulfilling its mission. *New Yorker* magazine quotes a senior DoD official:"'This was one of almost two thousand missions that have been conducted over the last couple of years, night after night.' . . . On the night of May 1st alone, special-operations forces based in Afghanistan conducted twelve other missions; according to the official, those operations captured or killed between fifteen and twenty targets."

Nonetheless, the bin Laden mission almost ended in a catastrophe. One of the two assault aircraft –Black Hawks that had been highly modified with low observables technology and dubbed the "Stealth Hawk" in the press – made a hard landing just after reaching bin Laden's complex. *The New Yorker* article cites "settling with power" (vortex ring state) in close proximity to the building walls as the cause. *Aviation Week* called it "a miscalculation of temperature in and outside the compound. The Black Hawk ran into lift trouble due to a 15°F difference inside the courtyard." In any event, Abbottabad, Pakistan is just over 4,100 ft altitude; it was a warm night, flying with a full load and was likely weighed down with whatever modifications were made to create the "Stealth Hawk." Two MH-47 Chinooks carrying quick reaction forces – with two more Chinooks in reserve – filled in for the fallen "Stealth Hawk"; the damaged aircraft was destroyed, leaving only the tail as indication of its existence. Mission success was attained by building "backups" into the mission to overcome the limitations of the aircraft. This is an effective technique for a critical mission such as this; it is not effective for those missions in support of everyday operations. There, without backup aircraft, capabilities are lost and missions go uncompleted.

The second event *did* result in catastrophe. A CH-47D was hit by a rocket propelled grenade (RPG) during a nighttime insertion of reinforcements calling in for a fierce firefight near Tangi Joi Zareen, Afghanistan on August 6, 2011. The crash resulted in the loss of 38 lives – the single deadliest incident in the decade of war in Afghanistan. Again, the high altitude (8,000 ft to 10,000 ft above sea level) was likely a contributing factor. Since Aircraft Survivability Equipment (ASE) can't defend against unguided RPGs, the best defense is speed and agility, both of which are in short supply at high density altitudes with heavily loaded aircraft in constricted terrain.

These two events highlight the incredible potential and the heartbreaking shortfalls in capabilities of today's rotorcraft fleet. Aircraft losses and casualties could be dramatically lower with technologies that could be fielded. These accidents represent, in part, a lack of adequate investments in rotorcraft technology by DoD over the past 25 years. Rotorcraft are clearly at the high end of the utility curve in current and future envisioned combat. So why haven't next generation improvements been funded?

The current Army vertical lift combat fleet was envisioned, designed and developed a generation ago for employment against a contiguous, linear threat on the plains of Europe or across the frozen mountains of Korea. They were not designed for the current, high/hot asymmetric battlefield. With the exception of the V-22 Osprey, all currently deployed rotorcraft were designed during the Vietnam War. The Chinook first flew 50 years ago – September 21, 1961 – the Black Hawk in 1974

The Chinook is one of the few means available to reach the high mountains and valleys in Afghanistan. (US Army photo)

and the Apache in 1975. While there have been tremendous improvements in capability from the A-models to the latest versions, limitations of the basic aircraft designs remain. The significant increase in speed and range of a tiltrotor over the Marines' CH-46 Sea Knight is an example of the benefits of a completely new approach.

The DoD has a clear need for vertical lift aircraft that fly farther, faster, higher and more safely, with greater payloads, more reliability, greater situational awareness, improved survivability and a smaller logistics footprint. A series of DoD studies have shown the benefits that investments in technology would bring.

In response to AHS-led discussions on Capitol Hill in 2008, the US Congress requested DoD to "carry out a capabilities-based assessment that outlines a Joint approach to the future development of vertical lift aircraft and rotorcraft for all of the Armed Forces." In August 2010, DoD submitted its report to Congress on Future Vertical Flight (FVL), outlining the Capabilities Based Assessment (CBA), the FVL Science and Technology Plan, and planning for management and oversight. The Office of the Secretary of Defense is now staffing the actual FVL Strategic Plan, which is a modernization roadmap for the U.S. military's rotary wing fleet for the next 40 years. AHS, working through the Vertical Lift Consortium (VLC), has been urging OSD to sign and fully fund the FVL Strategic Plan.

Today we find ourselves at a strategic crossroads for DoD vertical lift aircraft. The current fleet's shortfalls in capability are due in large part to decisions to upgrade last generation's aircraft rather than developing next generation capabilities. The FVL Strategic Plan offers an integrated approach to requirements development, technology development and maturation and eventual acquisition. The FVL Strategic Plan calls for an increase in science and technology funds of $180M per year above the current annual amount of about $110M. This investment is essential for the development of vertical lift technologies and concept demonstrators that can close identified capability gaps with a low level of technology risk. Considering the estimated $5-10B in replacement costs for rotorcraft lost to date – not to mention the human costs – this seems like a wise investment.

DoD can leverage its funding for vertical lift needs by continuing to partner with industry efforts to develop the necessary technologies. With a signed and fully funded DoD FVL Strategic Plan, industry can align its resources in an informed and complementary manner, tightly focused on DoD's priority needs. Sustained DoD and industry focus and leadership, along with additional resources, can bring the FVL strategic vision to reality. These mutually supporting efforts promise to bring next generation capabilities to the warfighter while saving lives, saving aircraft and saving money. The FVL Strategic Plan is essential to break out of the current paradigm of remanufacturing and upgrades of existing systems. Ten years of conflict have shown us both the incredible capabilities and the heartbreaking limitations of today's rotorcraft.

To meet the challenges of the 21st century, we must begin now. DoD must provide the vision and resources to be able to develop the next generation capabilities needed to mitigate our current shortfalls and to provide dramatic new capabilities. The FVL Strategic Plan outlines a strategy to do both.