



# THE MILITARY HELICOPTER INDUSTRIAL BASE

Dr. Daniel Gouré



# Executive Summary

The health of the defense industrial base (DIB) continues to be a concern for the Department of Defense and U.S. lawmakers. The end of the Cold War saw a major contraction in the size of the defense industrial base and the number of major defense companies. As defense budgets declined, programs were truncated, extended or even terminated. Defense companies merged and some even left the sector entirely. Recent increases in defense spending due in large part to the events of 9/11 and the war in Iraq have been insufficient to return the DIB to its former relatively robust state. Projections for future defense budgets and anticipated procurement plans have provoked concerns regarding some sectors of the DIB and certain producers of defense goods.

One sector where observers have expressed some concerns is military helicopters or rotorcraft. Currently, there are four “major” prime contractors for helicopters in the United States: Sikorsky, Bell, Boeing and now Lockheed. These companies make up over 75 percent of the world production capability for military and commercial rotorcraft.

Each of the U.S. manufacturers is producing and supporting a number of military and/or commercial helicopters. Sikorsky is responsible for the military’s UH/MH-60 and CH-53 helicopters. Bell produces the UH-1Y and AH-1Z for the Marine Corps and is co-developing the V-22 tilt-rotor aircraft with Boeing. Boeing’s major products are the AH-64 Apache and the CH-47 Chinook. Each of these programs has recently been selected on a sole-source basis for not only major upgrades but also for the production of a substantial number (hundreds) of new helicopters. Lockheed Martin won the Presidential helicopter (VXX) competition with the US101 for 23 helicopters. Pending military helicopter contracts – the armed reconnaissance helicopter (ARH), light utility helicopter (LUH) and personnel recovery vehicle (PRV) – will expand current demand. Finally, most of these companies have plans for new commercial vehicles, some based on their successful military designs.

This is not a sector that is in danger. There is very strong demand for helicopters within each of the military Services. The four prime contractors are all in good financial condition. They have a stable base of orders from existing contracts, including new production, remanufacture and upgrades. Moreover, the potential market is likely to increase significantly over the next decade giving each an opportunity to grow their business. Therefore, the Department of Defense can be confident that with a competitive acquisition process this sector will serve DoD’s needs well.



A modern, highly capable fleet of helicopters is essential to U.S. national security. It is impossible to imagine a 21st Century U.S. military without a large role for helicopters. The Department of Defense (DoD) currently deploys more than 5,000 helicopters. For more than forty years, helicopters have played an increasingly prominent role in military operations. They perform a wide variety of missions including direct combat, reconnaissance, command and control, combat search and rescue, transport and logistics and humanitarian assistance. Helicopters also constitute a vital capability for the U.S. Coast Guard and other agencies of the Department of Homeland Security (DHS).

The role of helicopters in the military is certain to grow over the next several decades. The changing nature of the threats to U.S. national security – as already demonstrated in Iraq and Afghanistan – requires a transformation to create military forces that are operationally mobile, tactically agile, highly lethal, networked and flexible. Operations in urban environments will be more frequent, thus increasing demands for rotorcraft. Helicopters currently contribute to attainment of these desired force characteristics in many ways. DoD has programs underway to remanufacture and modernize thousands of helicopters. It also plans to deploy new types of helicopters and rotorcraft such as the V-22 Osprey. DoD intends that its future helicopter force will be faster, longer-range, more reliable, able to lift heavier loads and loaded with more capable C4ISR systems, thereby providing a major increase in the capabilities of U.S. forces. In addition to manned helicopters, a variety of unmanned rotorcraft (URC) are likely to begin to enter the force in the next few years.

Because the future of a transformed U.S. military rests rather heavily on the deployment of enhanced and advanced helicopters, it is reasonable to ask about the ability of the U.S. helicopter industrial base to meet this requirement. Starting in the mid 1980s, U.S. defense industry experienced more than a decade of contraction and consolidation as defense budgets fell to historically low levels. Recent increases in defense spending have not restored the U.S. defense industry to its former robust condition. Most sectors of the defense industrial base have been reduced to a small number of prime manufacturers. In contrast, the helicopter sector has remained relatively stable. This fact has led to concerns about the ability of these sectors to meet the demand to innovate, increase their efficiency and compete effectively for the few significant new program starts.

This report seeks to provide answers to three questions. First, what is the current state of the U.S. military helicopter industrial base? Second, what are its future prospects in light of anticipated procurements and the expected state of the commercial helicopter market? Third, what is the ability of the existing military helicopter industrial base to meet DoD's demands for innovation, effectiveness and a competitive acquisition process?





## The Current State of the U.S. Helicopter Industrial Base

The military helicopter industrial base in the United States consists of four large prime contractors: Sikorsky (a division of United Technologies), Bell (a division of Textron), Boeing and Lockheed Martin a new entry into the marketplace by virtue of its winning of the competition to provide Presidential helicopters. Together with the European companies Agusta Westland and Eurocopter, they account for more than 90 percent of the world's production of military helicopters.

The good news is that the current state of the military helicopter industrial base is quite good. The demand for military helicopters is expected to be quite strong with both major modification programs and new starts. Each of the Armed Services, the Coast Guard and Department of Homeland Security operate large helicopter fleets. The remainder of the Federal Government as well as states and municipalities also represent a large installed base of helicopters. The sheer size of these fleets and increasing demands on them for overseas and domestic missions means that the upgrade and retrofit market will be extremely strong in years to come.

Each of the major U.S. military helicopter manufacturers has platforms deployed for which they are providing services and support. There are also major remanufacture and new start programs underway that will provide continuing revenues and allow for the introduction of innovative ideas. Current estimates suggest that U.S. military helicopter production will rise by as much as 25 percent over the next five years, without the inclusion of planned new procurements. The value of the worldwide helicopter market over the next five years is expected to grow by almost 50 percent to nearly \$9 billion a year. The U.S. helicopter market alone is expected to increase by nearly that much over the next ten years. U.S. prime manufacturers can be expected to compete for much of this market.

Sikorsky is the original manufacturer of the UH/MH-60 Blackhawk, SH-60 Seahawk, and HH-60 Pavehawk, hundreds of which are deployed with the U.S. Army, Navy, and Air Force respectively. In addition, the Army plans to use some of the money saved from the cancellation of the Comanche to build approximately 1,400 new Blackhawks, instead of the prior plan to merely remanufacture Blackhawks. The Navy is also entering production of over 500 new Seahawks, which had previously been planned as remanufacture rather than new build. Together, these two programs will provide billions of dollars in revenue for Sikorsky for many years to come. Sikorsky Blackhawks also have found a significant international market. In addition, Sikorsky built and now supports the Navy/Marine Corps' CH-53 Sea Stallion, which the Marines have recently announced will be upgraded under the H-53X program in what many believe is essentially a new helicopter with new engines, airframe and electronic systems. Finally, Sikorsky is a major manufacturer of commercial helicopters, including the S-70, S-76, S-92 and recently purchased Schweizer to expand its presence in smaller helicopter markets.





Boeing produces the AH-64 Apache, the world's premier attack helicopter. The Army plans to buy 96 new D model Apaches for the National Guard and Reserve. In addition, Boeing will upgrade several hundred existing Apaches as well as provide support for the Apache fleet. Eight foreign countries deploy the Apache also. Boeing provides support to the existing fleet of CH-46/47 heavy lift helicopters and won a contract to produce/remanufacture some 370 new CH-47s for the U.S. Army. Boeing and Bell are teamed to produce the V-22 Osprey. Planned purchases include 360 for the Marine Corps, 48 for the Navy and 50 for the Air Force.

Bell Helicopter is also in an extremely strong position in the marketplace. It provides services and spare parts for DoD's fleet of UH-1, AH-1 and OH-58D helicopters. Bell is under contract to produce some 250 AH-1Z Super Cobras and UH-1Ys for the Marine Corps, which again the Marines have recently announced will be a build of new helicopters rather than the prior plan of remanufacture. Bell also produces and supports a large family of commercial helicopters, and has a strong international position in both military and commercial helicopters.

Finally, a team led by Lockheed Martin Corporation with AgustaWestland and Bell won the contract to provide some 23 Presidential helicopters. The US101, which will be built in the United States, represents one of the few cases of a new entrant into a sector of the U.S. defense industrial base.

A combination of strong demand for service and support, major remanufacturing contracts and several new starts are contributing to the strong financial position of each of the prime manufacturers in this sector. Over the next decade, engine upgrades alone are projected to be worth approximately \$7 billion. Sikorsky expects its revenues to more than double over the next several years, possibly to more than \$4 billion. The UH/MH-60 new build contract alone has an estimated value of over \$15 billion. Bell's success in both its military and commercial helicopter activities is earning it nearly \$2 billion a year and this will grow as V-22 production ramps up. Bell's commercial helicopter business is nearing \$1 billion a year. Sikorsky's and Bell's parent companies, United Technologies and Textron, respectively, are both showing strong growth in their other divisions. The CH-47 remanufacture contract is worth an estimated \$7 billion to Boeing. The current V-22 program is worth an estimated \$37 billion over the next several decades. The US101 contract has an estimated value of \$6.1 billion.

The prime manufacturers have demonstrated success in business process re-engineering. Sikorsky has significantly reduced its costs and expanded its margins by instituting new management and production procedures. Bell is said to be aggressively pursuing lean manufacturing. Boeing has significantly improved its productivity at both its Philadelphia and Mesa production/remanufacture centers. These efforts have resulted in reduced costs to the Government and increased revenues to these companies.

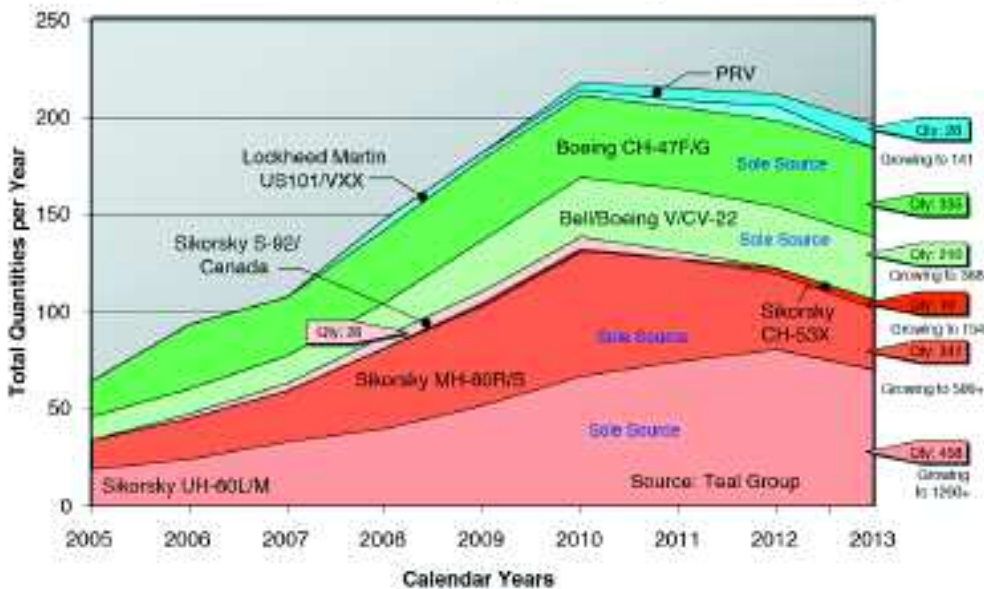
**Table 1: PRESENT PRODUCTION OPPORTUNITIES**

PLATFORM	QUANTITY	VALUE (\$ billion)	COMPANY
UH-60M	1,217	\$15.1	Sikorsky
UH-60L	200		
MH-60	500		
UH-1Y	100	\$6.7	Bell
AH-1Z	180		
CH-47F/G	370	\$7.0	Boeing
AH-64 D	96	\$2.0	Boeing
V-22	458	\$37.0	Bell/Boeing
HH-60J	34	TBD	Integrated Deepwater System

The above discussion (Table 1.) demonstrates the strength of this sector, the high demand for its products and, perhaps most important, the continuing competitiveness of all of its prime manufacturers. This analysis is based on existing programs and contracts and does not address future prospective business. Market forecasts suggest that Sikorsky, Bell and Boeing will increase their share of the worldwide military helicopter market. Together with Lockheed Martin, U.S. helicopter manufacturers will hold approximately 80 percent of this market over the next decade.



### North America Military Helicopter Industry



## Future Prospects for the Helicopter Industrial Base



The Department of Defense plans a series of new helicopter and rotorcraft procurements over the next several years. These provide additional means for the major prime manufacturers to expand their already substantial business base. They also represent opportunities for the primes to provide innovative solutions and develop new technologies that can extend the dominance of U.S. helicopter producers well into the 21st Century.

One of the most important of these is the personnel recovery vehicle (PRV) intended to rescue downed pilots and others in distress. This will be a replacement for the current fleet of Air Force HH-60 Pavehawks. The PRV is intended to fly faster, farther and higher than the Pavehawk, with a bigger cabin to provide more mission flexibility. All of the major prime contractors are expected to compete for this contract. The Air Force expects to purchase approximately 132 vehicles for an estimated total cost (both R&D and procurement) of \$10 billion. It is possible that more than one platform could win this competition.

The U.S. Army intends to award contracts, probably in 2005, for both an armed reconnaissance helicopter (ARH) to replace the aging fleet of Kiowas and a light utility helicopter (LUH) to replace the current fleet of UH-1s. The Army is expected to purchase hundreds of ARHs and LUHs.

In addition, as noted below (*Tables 2 & 3.*), the Marines plan a major multi-billion dollar development effort to build essentially new H-53s called the 53X program. This effort will not only provide substantial production work for over 150 fundamentally new helicopters but will also provide significant engineering work to Sikorsky. It is possible also that there will be new DoD customers for some existing helicopters. The U.S. Army could potentially acquire the V-22 Osprey to complement the ARH and LUH. The Air Force has a requirement for transport helicopters both for personnel and VIPs.

Other parts of the U.S. Government have plans for major helicopter and rotorcraft acquisitions. The U.S. Coast Guard's Deepwater Program envisions a mix of new and upgrad-

**Table 2: FUTURE PRODUCTION OPPORTUNITIES**

PLATFORM	QUANTITY	VALUE (\$ billion)	COMPANY
CH-53X	154	\$TBD	Sikorsky
AH-64D Block III	284	\$TBD	Boeing
Armed Reconnaissance Helicopter	TBD	~\$1.8	TBD
Light Utility Helicopter	TBD	~\$1.0	TBD
Personnel Recovery Vehicle	132	\$10.0	TBD



ed helicopters as well as URCs. The Bureau of Customs and Border Protection in the Department of Homeland Security is expected to acquire hundreds of helicopters to support its expanded efforts at U.S. borders.

In addition to the production of helicopters and rotorcraft such as the V-22, the prime manufacturers are also moving aggressively into the new area of unmanned rotorcraft. The U.S. Coast Guard is acquiring the Eagle Eye tiltrotor URC as part of the Deepwater Program. The U.S. Army has a program to deploy a series of unmanned aerial vehicles, including unmanned rotorcraft such as the Fire Scout. The developing market for URC not only provides new opportunities for the current set of prime manufacturers but also for new entrants into the military helicopter industrial base, such as Northrop Grumman. DHS is likely also to explore the potential of URCs to complement their fleet of manned helicopters.

**Table 3: OTHER GOVERNMENT PRODUCTION OPPORTUNITIES**

PLATFORM	QUANTITY	VALUE (\$ billion)	COMPANY
Multi-Mission Cutter Helicopter (MCH)	96	\$TBD	Intergrated Deepwater System (IDS)
VUAV	50	\$TBD	IDS
Air Force Transport & VIP Helicopter	50	\$TBD	TBD
Customs & Border Protection	420	\$TBD	TBD

For the longer term, there exist a number of possibilities for the military helicopter industrial base to develop new and innovative designs. A large quad rotorcraft is envisioned as follow-on to the C-130 aircraft. The Navy is exploring the concept of Seabasing, which envisions operating for protracted periods from a base of capabilities at sea. Seabasing will require new ship-to-shore connectors, possibly including new types of helicopters/rotorcraft. There is also a need for new approaches to vertical heavy lift.

The Deputy Under Secretary of Defense (Industrial Policy) produced the *Industrial Capabilities Report* on the vertical lift industrial base in July 2004. This report concluded that the helicopter industrial base currently is in a strong position. The requirements to refurbish a large fraction of the existing military helicopter fleet, near-term government procurements and increasing commercial sales will provide the major prime manufacturers with robust and growing earnings for a number of years. The existence of a number of sole-source contracts provides each of the major prime manufacturers with a lucrative and predictable flow of revenues.





However, the report did call on DoD to eschew the past practice of sole-source relationships, and to pursue a competitive acquisition process and undertake measures to promote innovation at every opportunity. The report identified the major near-term helicopter procurement programs (ARH, LUH and PRV) as opportunities to stimulate competition.

In addition, the report calls for DoD to promote technological innovation. One aspect of a strategy of innovation is continuing investment in tiltrotor technology, where the United States dominates the world market. The report stated that the PRV competition is the best near-term opportunity to pursue a strategy of innovation in the more traditional part of the helicopter technology base. The report recommends that DoD “leverage near-term program and maintenance support decision to enhance innovation in the industrial base by promoting innovation at every opportunity.” It also calls on the helicopter industrial base to move from a program-centric focus to one that emphasizes a system-of-systems approach consistent with the Joint Staff’s concept of functionally defined capabilities.

### **Assessment of Sector’s Ability to Meet DoD’s Demands**

It is the conclusion of this study that the military helicopter industrial base is quite robust. Given the fact that most of the incumbent suppliers are slated to receive billions of dollars in sole-source upgrades and follow on new builds of already selected rotorcraft platforms, DoD can expect each major contractor to be a strong participant in future competitions. There is a significant business base in the United States complemented by a large installed international base that provides additional opportunities for upgrade and services. Each of the major prime manufacturers is pursuing efficiency enhancement measures to lower their costs and provide a better product to their customers. Regardless of the outcomes of near-term competitions, each of the prime manufacturers will have a strong position in this sector for years to come.

In addition, several of the major participants in the military helicopter market also have a significant presence in commercial production and services. Sikorsky and Bell, in particular, are major providers of commercial helicopters, parts and services. Bell and Boeing are exploring commercial opportunities for the V-22.

There is a need for DoD to ensure competitiveness and innovation in this sector for both the near- and long-term. This should begin by pursuing a competitive acquisition process in near-term procurements. Competition should be extended to the promotion of new designs for both manned and unmanned rotorcraft. Competition sparks innovation and the introduction of new technologies. Competition is also important as a means of containing costs. Fortunately, given the strength of the military helicopter industrial base, there is no need to fear that a competitive environment will harm DoD’s future ability to have its needs met.





1600 Wilson Boulevard : Suite 900 : Arlington Virginia 22209  
tel 703.522.5828 : fax 703.522.5837  
[www.lexingtoninstitute.org](http://www.lexingtoninstitute.org) : [mail@lexingtoninstitute.org](mailto:mail@lexingtoninstitute.org)