



CRS Report for Congress

Air Force Transformation

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Summary

Many believe that the Department of Defense (DOD) — including the Air Force — must transform itself to ensure future U.S. military dominance. The Air Force has a transformation plan that includes advanced technologies, concept development, and organizational innovation. Issues for Congress include the efficacy of this plan, its feasibility, and the attendant costs. This report will be updated.

Introduction

Over the past several years, observers have increasingly discussed the need for DOD to transform itself in light of rapidly changing international circumstances.¹ Both the Clinton and Bush administrations argued that the United States must embark on a transformation path today, to meet a range of future security challenges.² Many defense thinkers agree, saying that while the world has changed greatly over the past 15 years, the military has not. Generally, today's military looks too much like that of the Cold War, they say. While the United States is today's dominant military power, past dominant powers have been surprised by changing circumstances and unforeseen threats.³

In May 1996 the Chairman of the Joint Chiefs of Staff published *Joint Vision 2010*, a conceptual template for how America's armed forces may exploit technological opportunities to achieve new levels of effectiveness in joint military operations. This transformation guide was updated, expanded and republished in May 2000.

DOD's 2001 Quadrennial Defense Review (QDR) described six critical operational goals to focus transformation efforts: (1) protecting critical bases of operations and

¹ The 1997 Quadrennial Defense Review (QDR); The National Security Strategy of the United States; The Secretary of Defense's Annual Report to the President and Congress; The 1998 National Defense Panel; P.L. 105-261, Title IX, Subtitle A, Sec. 903; The 2001 QDR.

² Secretary of Defense William S. Cohen, *2001 Annual Report to the President and the Congress*; George W. Bush, "A Period of Consequences," speech at the Citadel, Sept. 23, 1999.

³ Eliot Cohen, "Defending America in the Twenty-first Century," *Foreign Affairs*, Nov. 2000.



defeating weapons of mass destruction; (2) assuring information systems and conducting effective information operations; (3) projecting and sustaining U.S. forces in distant anti-access environments; (4) denying enemies sanctuary by providing persistent surveillance; (5) enhancing the capability and survivability of space systems; and (6) leveraging information technology and innovative concepts to develop an interoperable, joint command, control, communications and surveillance architecture.⁴ In November 2001, DOD established a new office, led by Arthur Cebrowski, to manage its transformation efforts.

It is generally accepted that transformation will require not just new technologies, but also new operational concepts and organizational innovation. Transformation will likely require more emphasis on (1) service and joint concept development and experiments, (2) science and technology efforts, tied closely to warfighters, (3) processes that identify and quickly operationalize promising concepts, and (4) interoperability efforts critical for effective coalition operations.⁵

DOD and the military services have developed transformation plans and, to varying degrees, embarked upon them. Yet, questions remain about cost, schedule, and the need to balance transformation objectives with near term modernization needs. Transformation is not modernization, which aims at improving existing capabilities. Thus, transformation and modernization efforts may diverge, and can compete for funds and priority.

Air Force Transformation Activities

The Air Force's transformation process is encapsulated in its Transformation Flight Plan (AFTFP). The AFTFP documents ongoing Air Force transformation efforts and ties them to the 2001 QDR's six operational transformation goals. The AFTFP describes the Air Force's six core competencies, efforts to adapt the Air Force culture and organizational structure, seven concepts of operations which are under development and 17 transformational capabilities that will enable them.

The Air Force defines transformation as "A process by which the military achieves and maintains asymmetric advantage through changes in operational concepts, organizational structure, and/or technologies that significantly improve warfighting capabilities or ability to meet the demands of a changing security environment."⁶ By this definition, Air Force leaders say that the Air Force has been engaged in a military transformation for decades and that current activities are a continuation of this process.⁷

Air Force officials contend that in the 1991 war with Iraq the Air Force demonstrated two of the three required elements of a military transformation: the use of new

⁴ U.S. Department of Defense, *Quadrennial Defense Review Report*, Sept. 30, 2001, p. 30.

⁵ Secretary of Defense William S. Cohen, *2001 Annual Report to the President and the Congress*, Chap.11: "A Strategy for Military Transformation."

⁶ U.S. Air Force, *The USAF Transformation Flight Plan, FY03-07*, HQ USAF/XPXT, Transformation Division, iv.

⁷ John Roos, "Effect-Based Operations," *Armed Forces Journal International*, Mar. 2001, p. 66; Brig. Gen. David Deptula, *U.S. Air Force Transformation Review*, Mar. 9, 2001, p. 5.

technologies (stealth and precision guided munitions) to enable novel operational concepts (effects-based planning, and parallel warfare) and “leap-ahead” capabilities (the total destruction of Iraq’s air power capabilities). Following this war, the Air Force launched organizational changes (joining the Strategic and Tactical Air Commands, and introducing the Expeditionary Aerospace Force (EAF)), that represented the final piece of this first phase of Air Force transformation.

Whether the Air Force view on its state of transformation is accurate or not, it appears that the Air Force has taken steps aimed at transformation, and has established processes designed to guide these efforts. Initiatives appear to address most if not all facets of the air power enterprise: the Air Force has borrowed a concept from the Army — called DOTMLPF — that reflects its desire to improve doctrine, organization, training, material, leadership, personnel, and facilities in a coordinated manner.

The Air Force has established six functional Battle Labs to develop new ideas and concepts. The Air Force also annually conducts wargames and experiments such as the Expeditionary Force Experiments. An Innovation Steering Group was established to guide transformation activities, and ensure “warfighter” inputs and feedback into the process. Changes have also been made to weapon acquisition and budget development and allocation processes. For example, the Air Force Resource Allocation Process, initiated in October 2000, is designed to give the Major Commands (e.g. Air Combat Command, Space Command, and Air Mobility Command) a greater voice in the budgeting process.

While Air Force officials express satisfaction with achievements to date, they say that Air Force transformation is not complete. The Air Force is continuing the process by pursuing advanced technology, new operational concepts, and organizational innovation.

The Air Force is pursuing technologies that it believes could engender new operational concepts, to dominate air, space, and cyberspace. These include high performance stealthy aircraft (the F/A-22 and Joint Strike Fighter (JSF)), unmanned combat aerial vehicles (UCAVs), directed energy weapons (such as the airborne laser), miniaturized munitions, and advanced command, control, communications, computers and intelligence (C⁴I). The Air Force’s space-related programs are in varying states of maturity, and include space-based radars, space-based lasers, micro satellites, “next generation” missile defense, and space operations vehicles. Air Force efforts in the area of cyberspace include computer network attack, computer network defense, and information assurance activities. Both space and cyberspace capabilities are expected to become increasingly important as the Air Force and the other services leverage U.S. information technology assets in numerous warfighting applications.

The impact of new technologies is limited if they do not create, new warfighting approaches. The Air Force says it is developing new operational concepts designed to exploit emerging technologies and enable new capabilities. These operational concepts are in varying stages of maturity and they often overlap. They range from very narrowly focused ideas to broad philosophies. They include but are not limited to the following.

Effects-based Operations (EBO) a framework for planning, executing, and assessing military operations. Its goal is to achieve effects through the tailored application of joint combat power. EBO may depend heavily on new capabilities such as “predictive battlespace awareness.”

Global Reconnaissance Strike/Global Strike Task Force (GSTF) an initial power projection concept, designed to defeat adversary anti-access threats (like surface-to-air, cruise, and ballistic missiles, that make it difficult to operate in a foreign theater). It would consist of a “kick down the door” force (B-2s and F/A-22s) that would make room for “persistence forces” like the JSF. A GSTF could employ Effects-based Operations.

Rapid Halt Operations would capitalize on precision, reach, advanced C⁴I and reconnaissance to rapidly employ tailored joint forces to control adversary actions and seize the initiative by isolating, incapacitating, and rapidly halting aggression.

The final facet of the Air Force’s ongoing transformation effort is organizational innovation. Organizational changes can be the most difficult and most important piece of the transformation puzzle. Organizational change is difficult because it involves human factors; non-quantifiable, social and psychological issues, such as tradition, culture, and mind set. However, organizational change is central to transformation, because it codifies and institutionalizes new capabilities and ways of doing business.

Refining the EAF is the Air Force’s main effort in the area of organizational change. The purpose of the EAF is to provide a structure and schedule to effectively meet contingency demands. The EAF organizes much of the Air Force into 10 Aerospace Expeditionary Forces (AEFs) that include combat, mobility, and combat support forces that rotate on a 15-month training and deployment cycle. Each AEF includes approximately 175 aircraft and 20,000 people from both the active and reserve components. AEFs (and two rapid-reaction Aerospace Expeditionary Wings) form the heart of the EAF, but strategic mobility forces and so-called low density/high demand (LD/HD) forces (such as U-2s and JSTARS) are also key elements. The Air Force hopes to deploy an AEF in 48 hours, and up to five AEFs within 15 days. Each AEF is tailored to the regional commander’s needs.

The Air Force completed its first full AEF rotation and began its second in December 2000. The Air Force learned some lessons from this first cycle, and refined the concept. It created additional LD/HD crews and linked them to the AEFs. Although this does not reduce the burden high deployment rates place on aircraft, it does help reduce the stress on people. The Air Force conducted another review following September 11th. This review spurred more changes to the AEF, such as more evenly distributing Reserve and Guard personnel throughout the 10 AEFs. To meet military requirements in Afghanistan, Iraq, and Korea, the Air Force deployed several units outside the normal 90-day AEF rotation between January and July 2003. Starting in July, 120-day AEF rotations began. While the Air Force reported in early 2004 that the AEF had returned to its 90-day schedule, thousands of troops remained on extended deployments.⁸

Issues for Congress

Congress may, as part of its defense oversight function, assess the merits of the Air Force’s transformation program: Is it aggressive enough? Is it feasible? Will it achieve the desired effect? Are transformation goals balanced with modernization needs? The debate over the F-22 and JSF programs offers an example of how transformation

⁸ Gordon Trowbridge, “AEF Schedule Back on Track,” *Air Force Times*, Feb. 23, 2004.

questions intersect, and may increasingly vie for Congressional attention. Evident in this debate are contrasting views on which technologies to pursue, how aggressively to pursue them, and the difference between transformation and modernization.

Critics of USAF plans to acquire F/A-22s and JSFs argue that these aircraft are modernization programs, and that the Air Force's requirement for new fighters would be adequately satisfied in the near term by upgrading and procuring F-15s and F-16s. They argue that the effectiveness of today's fighter and attack aircraft can be maintained through upgrades to their radars, command and control systems, and weapons. Future adversaries, they argue, will increasingly employ mobile cruise, ballistic and surface-to-air missiles that will jeopardize the forward operating bases that shorter range military aircraft — such as the F-22 and JSF — will require to generate significant sortie rates. By cancelling or truncating the F-22 and JSF, critics argue, the Air Force can free substantial funds that can be used to more aggressively pursue programs such as space-based assets, directed energy weapons, UCAVs, or long range bombers. Such programs are more likely to overcome tomorrow's anti-access threats, and offer more transformation potential.

Supporters of the Air Force's transformation plan counter that while the F-22 and JSF do modernize today's fighter and attack aircraft force, they will also transform air operations. Their combination of stealth and high aeronautical performance (e.g. maneuverability, speed, and endurance), will enable radical capabilities and operational concepts. Further, they argue, along with long-range bombers, stealthy high-performance aircraft offer the best potential for overcoming tomorrow's anti-access threats. Air Force supporters also contend that F-15s and F-16s are nearing the end of their useful lifetimes. Spending today's money perpetuating 1970s-era technology, they argue, is not wise. Finally, supporters note that the Air Force is already pursuing space-based assets, cyberspace operations, directed energy weapons, and UCAVs. The Air Force's current budget makes it difficult to spend more on these programs, given other pressing priorities.

An issue implicit in the debate described above, is the pace and aggressiveness with which the Air Force should pursue potentially high-payoff technologies such as space-based assets and unmanned aerial vehicles (UAVs and UCAVs). Many analysts argue that exporting many Air Force operations from the atmosphere to outer space could increase their effectiveness and survivability, and should therefore be pursued aggressively; perhaps at the expense of other programs. Others, including many in Congress, strongly support an increased use of UAVs to engender new warfighting capabilities, and to reduce the risk of U.S. casualties. In addition to setting aggressive goals for fielding UAVs, advocates also find fault with the decision not to accelerate procurement of the Global Hawk UAV, the Air Force's next generation airborne intelligence, surveillance and reconnaissance (ISR) platform.⁹ This perspective argues that the Air Force is prone to sacrificing transformation opportunities for modernization needs, and that a balance between modernization and transformation must be found.

Air Force officials argue that they are pursuing transformation programs as aggressively as is prudent within projected budgets. Current readiness shortfalls make Air Force modernization a tangible and high priority, that should not be sacrificed for transformation programs that may or may, not pay off years hence. If the Air Force is

⁹ See CRS Report RL30727, *The U-2 Aircraft and Global Hawk UAV Programs*.

asked to more aggressively lead DOD's efforts in these transformation areas, they argue, this effort should be funded in addition to modernization. Perhaps a re-examination of the traditional division of DOD's budget among the Services is appropriate, they argue.

Air Force organizational activities are also an issue. The Air Force believes that refining and implementing the EAF will have a transformational effect. Air Force officials say that the EAF compels the Air Force to organize and think about itself in terms of composite teams, not along functional "stove pipes." It also ensures that the units deployed to conduct a mission are at the peak of their training and readiness. Furthermore, Air Force officials believe that the EAF creates an expeditionary mind set and provides an effective mechanism for reducing personnel tempo, which in turn could ameliorate recruitment and retention problems. Finally, the Air Force believes that the EAF provides a basis for additional organizational innovation. As an example, Air Force officials cite the GSTF, which will be composed of the first two or three AEFs deployed to a theater.

Critics suggest that while a useful force management tool, the EAF concept is not transformational. The EAF, they argue, is a more modest organizational change (like changes instituted by the Navy many years ago) that simply facilitates rotational forward deployments of forces. To transform the Air Force's warfighting capabilities, the EAF, or other organizations, must inherently leverage new technologies and enable new operational concepts. These characteristics are not evident in the EAF, they argue. Furthermore, the recent fluctuations in the 90-day AEF deployment cycle shows, detractors argue, that this concept is still a work in progress.

A great debate also revolves around some of the Air Force's transformation operational concepts, such as Rapid Halt Operations. While many in the Air Force believe that air power alone can defeat or at least stalemate enemy ground forces, many other analysts — including many in the Army and Marine Corps — maintain that only ground forces can capture and control enemy territory and forces.

Many studies suggest that a final issue for Congress may be a review of its own role in transformation.¹⁰ Leading transformation thinkers argue that transformation faces powerful status quo opposition, and will be infeasible without close congressional coordination. They describe a need for new working arrangements between the Services and Congress. These studies assert that to achieve transformation, Congress should consider modifications to current budgetary oversight mechanisms, such as bi-annual budget authority, giving DOD managers more flexibility to shift funds between accounts, and removing statutory barriers to a greater private role in areas such as defense depot maintenance. They also say that Congress must play a role in managing the defense industrial base, in part by devising new rules and procedures that encourage technology development, rather than large weapon production quantities.

¹⁰ The 1998 National Defense Panel, p. vi, 67, 82; The Defense Science Board on Transformation, p.28.