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Kosovo: Implications for Military Intelligence

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ABSTRACT

NATO's successful air campaign in Kosovo reflected the use of precise intelligence for targeting precision munitions. The campaign's goal was to destroy key Serbian targets with minimal casualties to allied forces or civilians. At the same time the campaign clearly taxed intelligence capabilities; it demonstrated that there are limited numbers of manned reconnaissance aircraft and unmanned aerial vehicles (UAVs) as well as an inability to provide real-time intelligence data to combat aircraft on a routine basis. Since future DOD warfighting strategy is based on "high-tech" factors such as the combination of information dominance and precision weaponry, some observers believe that Kosovo operations should serve as a warning that difficult decisions and reallocations may be required if planned technical advantages can be realized in future military operations. This report describes the role of intelligence in Kosovo operations, the importance of intelligence to current and planned military operational capabilities, and the challenges facing the U.S. Intelligence Community in being prepared to support such operations. Special attention is given to the role of Congress in providing intelligence resources for evolving military missions. This report will not be updated.

Kosovo: Implications for Military Intelligence

Summary

North Atlantic Treaty Organization (NATO) aerial operations conducted in April-June 1999 against Serbian forces and installations (Operation Allied Force) demonstrated that an air campaign largely based on precision weapons can accomplish major military and political objectives even in the absence of a ground campaign. Eventual Serbian withdrawal from Kosovo was achieved with almost no casualties among friendly forces.

The prerequisite to success in NATO's air campaign was highly accurate allied, particularly U.S., intelligence and precision weapons. The combined use of precise intelligence and munitions to strike troop positions and stationary targets has been described as a major component of an ongoing technological revolution that is integral to defense planning in the post-Cold War world. Far different than the plans for second strike nuclear capabilities and extended deterrence that characterized earlier U.S. planning, the emphasis on precise targeting that limits friendly and non-combatant casualties greatly increases the need to collect, analyze, and disseminate intelligence in something approaching "real-time."

Despite a successful military outcome, however, the Kosovo campaign demonstrates that neither the Defense Department nor the Intelligence Community is yet fully prepared to provide the extensive intelligence support required in the military operations envisioned for the next century. Collection assets were stretched thin; resources had to be borrowed from other theaters. Intelligence could not in many cases be transmitted immediately to attacking aircraft. Several instances of erroneous bombing, including the attack on the Chinese Embassy in Belgrade, have been blamed on faulty intelligence.

It is widely agreed that limitations in U.S. reconnaissance capabilities—especially manned aircraft and unmanned aerial vehicles (UAVs)—must now be addressed. Acquisition of airborne reconnaissance platforms, as well as satellites, has been complicated by budgetary limitations and, according to some observers, by administrative shortcomings. Congress has expressed concern about inadequate progress on UAV programs in particular and some argue that the failure of the Executive Branch to present comprehensive reconnaissance plans for the entire Defense Department has forced Congress to make necessary trade-offs. Numerous detailed provisions in FY2000 defense and intelligence legislation deal with reconnaissance assets. The Conference Report on the FY2000 Defense Appropriations Act (P.L. 106-79) indicates that reconnaissance questions will be a matter of significant concern in consideration of future defense budgets.

Kosovo also demonstrated that other NATO countries are, in large measure, unprepared for the use of precise intelligence to support precision weaponry, even though such capabilities might cost less than the large ground force structures currently being maintained. This will present difficult challenges should the Alliance become involved in further combined operations, but the U.S. has only a limited ability to achieve the redirection of NATO defense planning.

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Kosovo: Implications for Military Intelligence

Background

Operation Allied Force, the air strikes launched by the North Atlantic Treaty Organization (NATO) against Serbian targets during the period March 24th through June 9th 1999, was a decisive factor in gaining Serbian President Slobodan Milosevic's agreement to withdraw his troops and security forces from Kosovo. John Keegan, a well-respected military historian concluded, "for the first time in military history, air forces won a war."¹ During the campaign some 37,000 sorties (i.e., one aircraft flight) were made and some 23,999 munitions were launched. In addition to Serbian forces in Kosovo, primary targets included Serbia's integrated air defenses; command, control, and communications systems; fighter aircraft; and ammunition and oil production facilities. Although somewhat higher figures were released during the course of the campaign, recent estimates indicate that there were 93 successful strikes on tanks, 153 on armored personnel carriers, 339 on military vehicles, and 389 on artillery and mortars. The bombing campaign did not halt the initial dispersal of Kosovar Albanians nor did it prevent a considerable number of atrocities, but in its final stages it resulted in Belgrade paying a heavy cost to maintain its position in Kosovo and, undoubtedly in conjunction with Russian pressure, led to Serbia's agreement to withdraw its forces.

The Importance of Intelligence²

The air campaign was dependent upon highly accurate and up-to-date information on the nature and location of Serbian targets. As Secretary of Defense Cohen testified to the Senate Armed Services Committee on July 20, 1999:

The operation . . . highlighted the importance of intelligence, surveillance, and reconnaissance — and the fact that the assets that provide these essential elements of success are in short supply. It demonstrated the immense potential of precision attack munitions to make possible military operations with an

¹ John Keegan, "How We Beat Milosevic: Leave It to the Historians," *Daily Telegraph*, July 12, 1999.

² Arguably, a major intelligence failure was the erroneous assumption in the early months of 1999 that Serbian President Milosevic would capitulate after the initial two or three days of bombing; the process of negotiations and the expectations of Serbian behavior is, however, so interlinked with policy decisions that it is excluded from discussion in this report; see (name redacted), *Kosovo: Review and Analysis of Policy Options, 1998-June 1999*, CRS Report RL30265, July 21, 1999.

effectiveness and accuracy undreamed of only a few years ago — and made clear that we must assure that we have sufficient supplies of these munitions.³

The Kosovo campaign depended upon intelligence from a variety of sources. Imagery and signals intelligence (sigint) collected by manned aircraft and unmanned aerial vehicles (UAVs) were used by NATO commanders to direct attacks by allied aircraft operating over Kosovo and Serbia. To facilitate attacks on stationary installations (in both Kosovo and Serbia proper) video images were fused with digital terrain elevation data provided from national satellites. This data was used to target cruise missiles launched by submarines in the Adriatic and by B-1 bombers operating from bases in the United States.

In the early phase of the campaign more than ninety percent of bombs and missiles used were precision-guided; in later stages more “dumb” bombs were used as a result of NATO’s control of the air, improved weather conditions, and decreased stocks of precision weapons.⁴ Even unguided weapons were, however, aimed within precisely defined areas to strike oil refineries, ammunition storage sites, and troop staging areas.

The effective use of intelligence in Kosovo in large measure resulted from lessons learned in the Persian Gulf War of 1991. Desert Storm had seen national intelligence systems successfully supporting tactical operations and the emerging importance of precision guided weapons. The air campaign revealed many shortcomings, however, in facilitating the rapid use of large quantities of information. One Air Force historian described the major shortcoming as the “difficulty of melding the U.S. Air Force planning, operations, and intelligence functions into a smoothly functioning team” as a “potentially grave organizational flaw.”⁵

In the aftermath of Desert Storm, the Department of Defense (DOD), with strong congressional encouragement, set about to remedy serious organizational flaws, enhance reconnaissance capabilities, and resolve intelligence-related limitations. Communications links were established to allow information from satellites and other national-level collection resources to be used to support combat operations. Interoperability among surveillance and communications systems of the four services and various agencies was significantly improved. Virtually all observers have concluded that, as a result of these innovations, intelligence support in Kosovo operations was far more timely and effective than it had been in the Persian Gulf conflict. There were no reports that massive paper printouts had to be ferried around by helicopter because of inadequate communications, as notoriously occurred during Desert Storm.

³ Prepared Statement of the Honorable William S. Cohen to the Senate Armed Services Committee Hearing on Operations in Kosovo, July 20, 1999, p. 5.

⁴ Anthony H. Cordesman, “The Lessons and Non-Lessons of the Air and Missile Campaign in Kosovo,” (Washington: Center for Strategic and International Studies, September 22, 1999), p. 21.

⁵ Richard G. Davis, “Strategic Bombardment in the Gulf War,” in R. Cargill Hall, ed., *Case Studies in Strategic Bombardment* (Washington: Air Force History and Museums Project, 1998), p. 611.

Much more profound than enhancing systems interoperability, however, has been an ongoing effort to rethink fundamental force structure and organizational issues in light of a new technological and geopolitical environment. A series of reviews—the Quadrennial Defense Review, the Report of the National Defense Panel, the Defense Reform Initiative, *Joint Vision 2010*—have all envisioned a defense policy based heavily on maneuverable forces employing “information dominance” and precision munitions to gain victory in a wide spectrum of different combat situations. DOD’s Quadrennial Defense Review of May 1997 anticipated that:

With the support of an advanced command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) common backbone, the United States will be able to respond rapidly to any conflict; warfighters will be able to dominate any situation; and day-to-day operations will be optimized with accurate, timely, and secure information.⁶

Joint Vision 2010, prepared by the Joint Chiefs of Staff, provided a future conceptual framework of warfare the basis of which “is found in the improved command, control, and intelligence which can be assured by information superiority.”⁷ It argued that in the coming century “Commanders will be able to attack targets successively with fewer platforms and less ordnance while achieving objectives more rapidly and with reduced risk. Individual warfighters will be empowered as never before, with an array of detection, targeting, and communications equipment that will greatly magnify the power of small units.”⁸

Far removed from the concepts of massive retaliation and extended nuclear warfare that once characterized American defense policy, current and future planning is dependent upon technological innovations to achieve dominant battlefield awareness, information superiority, precision engagement, and dominant maneuver. A major goal is to employ evolving technologies to accomplish military objectives while minimizing noncombatant casualties and destruction of property.⁹ So designed, U.S. forces are to be able to undertake successfully a full spectrum of operations from counternarcotics to major regional conflicts with a force structure considerably smaller and less costly than that maintained at the height of the Cold War.

⁶ William S. Cohen, Secretary of Defense, *Quadrennial Defense Review*, May 1997, p. 39.

⁷ Chairman, Joint Chiefs of Staff, *Joint Vision 2010: America’s Military: Preparing for Tomorrow*, p. 19.

⁸ *Ibid.*, p. 13.

⁹ In this respect, current planning harks back to the emphasis on strategic bombing that guided Air Force planning before and during World War II. In large measure it was limitations in weapon accuracy (along with political pressure for fast results) that led to the resort to widespread area bombing and, subsequently, nuclear attacks. Cold War nuclear planning also tended to blur distinctions between attacks on military or industrial targets and the urban areas in which they were located.

Persisting Problems

Ongoing defense planning presumes the availability of dominant battlefield awareness; but, as yet, no overall implementation plan has been established for achieving it. The Kosovo experience, while successful in its outcome, revealed important limitations in intelligence capabilities and demonstrated that information dominance in an operational sense has not been realized.

Currently deployed technological capabilities could not ensure that information available to all parts of the Intelligence Community was consistently provided to military commanders in precise enough form for real-time targeting purposes; in some cases, delays of several hours precluded reactive strikes. Although information can be relayed to ground-based headquarters, in many cases it cannot be linked directly to strike aircraft; the need to relay it from the ground stations can preclude immediate response to ongoing enemy activity. In some cases, an inability to relay perishable intelligence made it impossible to prevent attacks on defenseless civilians.¹⁰

Kosovo operations made it evident that current reconnaissance assets were stretched very thinly.¹¹ Manned reconnaissance aircraft capabilities center on U-2s, the high-altitude aircraft originally designed for overflights of the Soviet Union in the 1950s, for imagery; Rivet Joint, Boeing 707s configured as sigint collectors; other radar and telemetry collection platforms, and JSTARS aircraft with ground-search radars. U-2s provided over 1300 hours of collection time, collecting according to one Air Force source, over 80% of the total imagery for Operation Allied Force.¹² There are, however, only some thirty-five U-2s in the Air Force inventory and a similar number of qualified pilots; Kosovo operations placed major constraints on the total force as did the need to detail pilots and support personnel from other regions.¹³ In the aftermath of Kosovo, Secretary of Defense Cohen acknowledged that “we are at a critical juncture in airborne reconnaissance.”¹⁴

In Kosovo, as in Desert Storm, U.S. and allied UAVs performed admirably in collecting imagery without risking the loss of crewmembers. Unfortunately, UAV acquisition programs have been the source of considerable frustration in both

¹⁰ See Cordesman, p. 196.

¹¹ For background information on reconnaissance systems, see (name redacted) and Richard A. Best, Jr., *Intelligence Collection Platforms: Satellites, Manned Aircraft and UAVs*, CRS Report 98-495F, May 21, 1998.

¹² Gigi Whitley, “Air Force Official Praises U-2's Operation Allied Force Performance,” *Inside the Air Force*, October 1, 1999, pp. 3-4.

¹³ SR-71 Blackbird aircraft, no longer maintained in the active inventory of the Air Force, can overfly hostile targets with far less vulnerability than the U-2s and some argue that they could be usefully employed in post-Cold War operations. Nonetheless, the Defense Department opposes any move to return them to active service because of cost considerations and crew availability.

¹⁴ Memorandum on Unmanned Aerial Vehicles, July 6, 1999, reprinted in *Inside the Air Force*, July 16, 1999, p. 29.

Congress and the executive branch.¹⁵ Despite an estimated \$2 billion in investment and several reorganizations, only one UAV system capable of extended operations, the Air Force's Global Hawk, is currently being acquired and one of two Global Hawk test vehicles crashed in March 1999. The Air Force expects to make a final acquisition decision for Global Hawk in early FY2001, with a recently reported goal of acquiring a "fleet" of the UAVs.¹⁶ DOD is attempting to come up with a sensor configuration for Global Hawk that will meet most of the existing requirements without unduly adding to expense or delaying production schedules.

Some view Global Hawks as replacements for the aging U-2s and suggest accordingly that there is no need to upgrade existing U-2s or develop new manned platforms. Others argue that manned reconnaissance platforms will continue to have certain inherent advantages over UAVs. Supporters argue that they can carry a more diverse variety of sensors and point to the advantages of allowing a pilot to maneuver based on his own observations.¹⁷ The heavy demands currently placed on U-2s throughout the world and the limited numbers of available UAVs suggest that manned reconnaissance vehicles will have an important role for the foreseeable futures.

Furthermore, deployed shorter range UAVs proved vulnerable to Serbian attacks; four of the eight Air Force Predator UAVs were lost as were four Navy Pioneer UAVs and six or seven Army Hunter UAVs. These losses resulted in part from the fact that UAVs flew at lower altitudes than manned aircraft. Although UAVs are considered expendable, the lost platforms will need to be replaced with comparable or more capable models.

Reconnaissance satellites also provided valuable information during the Kosovo campaign. Originally designed to acquire information on Soviet missile and submarine sites for national level decisionmaking, sigint and imagery satellites with near-real-time communications capabilities have established an important role in providing information to military commanders at all levels. There remain nevertheless constraints on using satellite imagery in real-time operations.¹⁸

¹⁵ See Thomas E. Ricks and Anne Marie Squeo, "Why the Pentagon is Often Slow to Pursue Promising New Weapons," *Wall Street Journal*, October 12, 1999, p. 1.

¹⁶ Frank Wolfe, "Air Force May Ask for 'Fleet' of Global Hawks in '01 Request," *Defense Daily*, September 16, 1999, p. 1.

¹⁷ One other approach that has been attempted is the acquisition of reconnaissance "pods," i.e. sensor packages that can be attached to various types of aircraft thus permitting them to serve as reconnaissance platforms as needed. A key advantage is that they can preclude the need for dedicated reconnaissance aircraft. Naval units operating in the Adriatic in support of Kosovo operations included F-14 aircraft with Tactical Airborne Reconnaissance Pods (Tarps). The Marine Corps deployed three F/A-18D aircraft modified with Advanced Tactical Airborne Reconnaissance Systems (Atars) including electro-optical camera and infrared devices for night operations. The planes will have data links that can relay digital imagery in real time to ground stations.

¹⁸ The Director of the National Reconnaissance Office (NRO) has pointed out that in Operation Allied Force newly designed joint targeting workstations were used to correlate satellite information with data derived from airborne platforms and feed targeting data directly to strike aircraft. He noted, however, that the NRO had had to field prototypes on a rush

Many observers conclude that intelligence resources devoted to providing better imagery and other data to tactical commanders have not kept pace with the increasing emphasis that is being placed on the use of precision weapons. Airborne reconnaissance platforms, in particular, have not been acquired in sufficient numbers to support the wide variety of post-Cold War missions that may be likely. There is a perception that given shrinking defense budgets since the late 1980s, the services and DOD have emphasized major weapons systems and somewhat deemphasized the systems that collect the data that is essential for their use.

Certain Kosovo operations also called into question the adequacy of intelligence data bases for precision attacks on stationary targets as well as procedures for designating targets. On May 7th, the Chinese Embassy in Belgrade was mistakenly bombed as a result of a faulty database and inadequate coordination. The resulting contretemps with Beijing has led to a realization that intelligence databases as currently maintained are inadequate.¹⁹ The Intelligence Community has only recently begun to lay the foundation for maintaining global databases with, for instance, efforts to acquire civilian imagery and by launching a new space mission to create a more detailed topographical database for most of the Earth. DCI Tenet has acknowledged the problems surrounding this effort:

Data base maintenance is one of the basic elements of our intelligence effort, but it is also one that has suffered in recent years as our workforce has been spread thin. Some have suggested that this failure is the consequence of resource shortfalls. A more fundamental problem is not the absolute level of resources, but the application of resources at our disposal. We have diverted resources and attention away from basic intelligence and data base maintenance to support current operations for too long.²⁰

basis and suggested that the services should integrate such equipment into operating platforms. Frank Wolfe, "Hall: Joint Targeting System Sees First Use in Kosovo," *Defense Daily*, July 9, 1999, pp. 2-3.

¹⁹ The attack on the Chinese Embassy in Belgrade on May 7th was an especially embarrassing intelligence failure. The intended target was the Yugoslav Federal Directorate of Supply and Procurement, but that installation was confused by intelligence analysts with another building located a block away. That structure in turn was actually the Chinese Embassy (even though U.S. Government maps indicated the embassy at a former site some miles away). The problem derived, according to testimony before the House Intelligence Committee on July 22nd, from an analyst's mislocation of the Yugoslav Supply Directorate and the absence of subsequent evaluation to discover the error. U.S. officials who did know the accurate location of the Chinese Embassy (which was never a target and thus not on any target list) were not participants in the targeting review. George Tenet, "DCI Statement on the Belgrade Chinese Embassy Bombing, House Permanent Select Committee on Intelligence Open Hearing, 22 July 1999."

²⁰ DCI Statement, p. 5.

Congressional Concerns

Although FY2000 authorization and appropriations legislation was under consideration by Congress prior to the beginning of operations in Kosovo, limitations in intelligence capabilities during Operation Allied Force resulted in budgetary adjustments that have been reflected in report language submitted by intelligence, armed services, and appropriations committees.

Given the disparate nature of the programs as well as the fact that many are discussed in classified annexes to intelligence and defense authorization bills, it is difficult to identify all the changes. However, the House Appropriations Committee expressed concern about deficiencies that

... have been well known for some time. These include, but are not limited to: electronic warfare aircraft and specialized jamming equipment; tactical intelligence collection and dissemination assets (ranging from collection assets such as the U-2, RIVET JOINT, AWACS, and JSTARS aircraft and tactical UAVs; interoperable, secure communications and command and control, to include new data links and data fusion capability).... The Committee has consistently supported additions over DOD budget requests for such programs over the years. Nevertheless, continued shortages in these and many other categories clearly posed operational constraints during [Operation]... Allied Force. This not only impeded the regional commands charged with prosecuting the air campaigns, but also other regional commanders who were confronted with the physical diversion of assets from their areas of responsibility and other unexpected resource shortfalls.²¹

As a result, the Committee gave special consideration to intelligence and reconnaissance systems and provided \$270 million above the Administration's budget request to fund a variety of upgrades for tactical reconnaissance assets, including the following major items:

Predator UAV	\$20 million
Global Hawk UAV	25 million
Rivet Joint	102 million
U-2	36 million
Joint Sigint Avionics	17 million ²²

Senate Appropriations Committee actions included additional funding for Hunter UAVs, for modifying Navy reconnaissance aircraft, improvements to the U-2s, and precision attack targeting pods for Air Force F-16s. Other adjustments were made by the armed services and intelligence committees. The House Armed Services

²¹ U.S. Congress, 106th Congress, 1st session, House of Representatives, Committee on Appropriations, *Department of Defense Appropriations Bill, 2000*, July, 1999, H.Rept. 106-244, p. 13.

²² Ibid., pp. 25-26.

Committee, for instance, added funds for an additional JSTARS aircraft, hardware and software upgrades of the Army's Hunter UAVs, the Air Force's Global Hawk, and strongly recommended that the Secretary of the Navy reassess his service's maritime patrol aircraft program. Additions by the Senate Armed Services Committee included \$138 million for extending the operational lives of Navy reconnaissance aircraft, \$60 million for re-engineing two Air Force RC-135 aircraft, \$46 million for additions to the JSTARS program, and \$5 million for research into airborne remote sensing of chemical agents. Among other actions, the House Intelligence Committee added funds for UAVs control systems, for Global Hawk, for Predator UAV enhancements, electro-optic framing technologies, and "a revolutionary new spectral exploitation technology." The Senate Intelligence Committee added \$31 million in Global Hawk funds, \$12 million for joint sigint avionics equipment, and \$9 million for upgrading the U-2's electro-optical reconnaissance system.

This illustrative and incomplete list of committee actions reflects the diversity of intelligence and intelligence-related programs that Congress authorizes and for which it appropriates funds. Some observers argue that the Executive Branch does not provide a well-coordinated package of reconnaissance programs (that includes intelligence, intelligence-related, and other systems) and, as a result, congressional committees find it necessary to make an excessive number of judgments, cuts, additions, and trade-offs among a wide variety of different proposals. These adjustments, they further maintain, are necessarily taken in piecemeal ways. The perceived need for congressional "micromanagement" allows inadequate opportunity to assess the implications of funding changes to individual reconnaissance efforts on other programs inasmuch as some reconnaissance programs are not under the jurisdiction of either intelligence committee. Trade-offs between national and tactical systems, e.g. between satellite collection and high-altitude UAVs, can be especially difficult to make, given the disparate programs through which they are acquired.

The conference report (H.Rept. 106-371) accompanying the FY2000 Defense Appropriations Act (P.L. 106-79) that was submitted in early October 1999 underlined congressional concerns with acquisition and maintenance of reconnaissance programs in the light of operations in Kosovo. The conferees provided an additional \$15 million for Global Hawks, but expressed concern about future funding of the program, pointedly noting that using other intelligence, surveillance, and reconnaissance assets "as a 'bank' from which to draw funds for the Global Hawk program would likely not serve the best interests of the Department of Defense."²³ The Committee acknowledged that the U-2 is "the premier tactical reconnaissance asset requested by CINCs [commanders-in-chief of the regional commands] around the world" and "was considered by many to be the 'backbone' of the airborne Intelligence, Surveillance, and Reconnaissance (ISR) mission in Kosovo."²⁴ Conferees provided \$10 million for U-2 cockpit and defensive system upgrades, but expressed concern future availability of U-2 platforms and pilots. Furthermore, DOD

²³ U.S. Congress, 106th Congress, 1st session, Committee of Conference, *Making Appropriations for the Department of Defense for the Fiscal Year Ending September 30, 2000, and for Other Purposes*, H.Rept. 106-371, October 8, 1999, pp. 237-238.

²⁴ H.Rept. 106-371, p. 198.

was requested to submit a report on the adequacy of U-2 capabilities within ninety days of enactment.

The Appropriations Conference Committee further requested a report on the successes and deficiencies of Kosovo operations specifically including analyses of intelligence and counterintelligence systems, target selection, and bomb damage assessment processes. In another section, the Committee requested a report from the Secretary of Defense regarding requirements, plans, and resources needed to maintain, update, modernize, restore, and expand the fleet of aircraft and related equipment known as “Low Density, High Demand Assets.” The Committee included in this category, U-2, JSTARS, and Rivet Joint aircraft, tactical UAVs, data links, and data fusion capabilities.

Requests for these studies reflect congressional concerns about intelligence capabilities and a need for further information and analysis from the Executive Branch. The Appropriations Conference Committee expressed a need for a comprehensive plan with dollar amounts for the next ten years. Observers believe that greater attention as well as additional resources will be devoted to reconnaissance efforts in coming years, but choices among differing technological approaches remain to be made. Most expect continuing roles for satellites, manned aircraft, and UAVs—as well as other approaches—but the nature of the mix and the organizational infrastructure tying different systems together has yet to be resolved.

Cold War-era satellites are reaching their end of their expected lifespans and are to be replaced with larger numbers of somewhat less-capable systems beginning in FY2003.²⁵ However, there is significant concern in Congress that funding for new satellites has not been matched by a commitment to ensure adequate resources and techniques for analyzing and using the vast quantities of data acquired. In reporting its version of the FY2000 Intelligence Authorization bill (H.R. 1555) the House Intelligence Committee stated its belief that inadequate planning for analysis and related functions:

... cannot best be solved solely by hiring hundreds of additional imagery analysts, although there will probably be a need to hire and train many more than are currently projected. A commitment to development and deployment of analytical tools and infrastructure as well as, research into other areas or capabilities that might cue an imagery analyst, are other areas where solutions beyond mere personnel increases are in order.²⁶

²⁵ See Robert A. McDonald, “NRO’s Satellite Imaging Reconnaissance: Moving from the Cold War Threat to Post-Cold War Challenges,” *Defense Intelligence Journal*, Summer 1999. The National Reconnaissance Office announced on September 3, 1999 that the Boeing Company had been awarded a contract to develop and operate the new generation of imagery satellites.

²⁶ U.S. Congress, 106th Congress, 1st session, House of Representatives, Permanent Select Committee on Intelligence, *Intelligence Authorization Act for Fiscal Year 2000*, H.Rept. 106-130, Part 1, May 9, 1999, p. 13.

The availability of high-quality satellite imagery from commercial sources continues to expand, raising questions for some Members about the need for government systems that to some extent duplicate commercially available imagery. In reporting the FY2000 Intelligence Authorization bill (S. 1009), the Senate Intelligence Committee “strongly urges the National Imagery and Mapping Agency to identify those imagery requirements that can be met by commercial provide[r]s so that funds can be targeted for the purchase of commercial imagery.”²⁷

Future Trends

Beyond dealing with numbers of intelligence collection platforms, some observers argue there needs to be a different approach to providing the intelligence support in the types of military operations likely to occur in the next century. There is an assumption that, given the post-Cold War international environment, the detailed knowledge of the battlespace now technically achievable can in effect substitute for the larger force structures (and their organization and operational styles) that long characterized American defense policy.²⁸ Intelligence becomes an integral part of this approach, but only if an extensive (if not global) data base is established, and if intelligence producers can become more closely integrated into military operations in ways that have not yet been achieved.²⁹ Undoubtedly essential is the creation of a much more integrated intelligence “grid” that can be directly accessed by warfighters at national, operational, and tactical levels. Information from the grid will be fed directly into weapons systems used at all levels of warfighting.

Direct, constant access to intelligence may, however, require even greater changes to existing organizational practices beyond those that have already been accomplished. Some observers argue for further consolidation of intelligence agencies, suggesting that the distinctions between national, departmental, and tactical systems are increasingly less valid and, accordingly, provide less justification for the

²⁷ U.S. Congress, 106th Congress, 1st session, Senate, Select Committee on Intelligence, *Authorizing Appropriations for Fiscal Year 2000 for the Intelligence Activities of the United States Government and the Central Intelligence Agency Retirement and Disability System and for Other Purposes*, S.Rept. 106-48, May 11, 1999, p. 5.

²⁸ Other observers argue, however, that such theoretical planning for future warfare may not take into account the likelihood that the U.S. forces will be repeatedly engaged in various forms of peace enforcement operations, rooting out technically unsophisticated, but nonetheless dangerous, threats from terrorists groups and various criminal elements. In such scenarios, “dominant battlefield knowledge,” may not be an achievable or even a relevant objective and a higher priority will be on human intelligence about various political or ethnic factions.

²⁹ Questions have recently been raised within the Air Force about the need to have better capabilities to manage air attacks in response to the flow of incoming intelligence; and some believe that better procedures should be established to update daily air tasking orders (ATOs), the multi-service documents that designates specific targets for individual aircraft. See Cordesman, p. 76; also Bryan Bender, “USAF Rethinks Targeting Process,” *Jane’s Defence Weekly*, September 8, 1999, p. 13.

separate organizations that operate them.³⁰ Others foresee that with weapons systems being developed with integral links to reconnaissance sensors, service intelligence agencies will have a larger role with their personnel becoming more fully integrated into each service's operating forces. In any event, the long-established patterns of separate intelligence and operational entities in each of the services are likely to be altered significantly.

A major concern during Kosovo operations was the difficulties in coordinating U.S. and allied air forces. It is clear that the United States has invested far more heavily than our allies in tactical reconnaissance capabilities as well as in precision munitions. Observers have concluded that only the British and to some extent the French air forces could work closely in combined air operations with U.S. forces. Given the U.S. commitment to information warfare, the gap in capabilities and tactics may increase significantly. Secretary Cohen stated that:

We could not . . . have carried out this operation alone. A great deal of this operation, however, rested on American capabilities. The United States conducted virtually two-thirds of all the support sorties that were flown and half of all combat missions. And because we were the only country with precision-guided munitions that can operate in all weather, heavy cloud cover in the initial stages of this campaign made it almost an exclusively American operation.

Moreover, I'd point out that not all of our allies possess the kind of communications gear that's required to maintain total security. As a result, there were times when our pilots had to communicate over insecure lines and that allowed the Serbs to perhaps intercept and make use of this source of information to compromise the effectiveness of the air campaign itself and put our pilot's lives unnecessarily at risk.³¹

European NATO members continue to deploy sizable forces, but they are structured to counter a ground attack on Alliance members. Observers suggest that the threat of ground attack on Western Europe is at best remote for decades to come; more likely is European involvement in peacekeeping or peacemaking operations in various parts of the world, including, but not limited to, the fringes of Europe. Observers—and some key NATO officials—believe that, for the same level of defense expenditures, NATO countries could create force structures much more useful for the probable post-Cold War environment. Further, they argue, that the innovative technologies now adopted by the United States could be acquired by the European NATO states. While they are not inexpensive, they are far less expensive than maintaining large standing forces.³²

³⁰ See William A. Owens, "Intelligence in the 21st Century," *Defense Intelligence Journal*, Spring 1998.

³¹ Remarks to the International Institute for Strategic Studies as Delivered by Secretary of Defense William S. Cohen, Hotel del Coronado, San Diego, California, Thursday, September 9, 1999.

³² See David G. Gompert, Richard L. Kugler, and Martin C. Libicki, *Mind the Gap: Promoting A Transatlantic Revolution in Military Affairs* (Washington: National Defense University Press, 1999).

With ongoing and planned changes in U.S. forces that emphasize information dominance and precision weapons, it will be increasingly difficult to manage combined operations. European NATO forces, with exceptions, may be limited to support roles while U.S. troops are directly engaged in combat operations. Observers believe that such an imbalance may be unsettling to the American people as well as limiting overall military capabilities.

There are not insuperable gaps between U.S. and European intelligence collection capabilities. Indeed, European forces are already making regular use of UAVs and manned reconnaissance aircraft and there are plans under consideration for a European reconnaissance satellite capability. Overall collection capabilities, however, remain significantly more limited than those of U.S. forces and there are considerable problems of connectivity and interoperability with U.S. systems. It is not clear, however, that European members of NATO are as yet prepared to make the necessary investments and adjustments to ensure that they have adequate intelligence and communications systems that are interoperable with U.S. systems. Many allies have not, as yet, demonstrated a serious intent to implement NATO's recently adopted Defense Capabilities Initiative that is centered around more mobile and sustainable forces adapted to post-Cold War missions. It is in the U.S. interest to promote greater interoperability with European NATO forces, but most observers conclude that European acquisition of better reconnaissance capabilities and precision munitions will take an extended period at best and is only partially subject to U.S. influence.

Conclusion

The bombing campaign in Kosovo and Serbia—resulting in Serbian withdrawal and almost no allied casualties—was a testimony to the intelligence capabilities acquired by U.S. forces in recent years, combined with precision munitions. At the same time, the campaign suggests that these capabilities are limited in quantity and that should significant hostilities occur in two separate regions intelligence resources could be inadequate. Furthermore, much remains to be done if the available technology is to be deeply embedded in defense capabilities of the United States and its NATO allies. Given the expectations of the public, resulting from the Kosovo and Persian Gulf experiences, that post-Cold War hostilities can be successfully concluded with minimal allied losses and limited collateral damage, many observers expect that there will be an increasing emphasis on investments in intelligence technologies as well as on the reorganization of intelligence capabilities to apply them to tactical level warfighting. Congress has not, however, received a comprehensive plan for achieving these desired capabilities.

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