EMERGING TECHNOLOGIES AND U.S.-ROK SECURITY COOPERATION

by Roger A. Brooks

The NATO alliance, confronted with growing Soviet mechanized forces in Eastern Europe, and recognizing the political and economic constraints that prohibit a military production program to match the Soviet effort, long has relied on the threat of nuclear retaliation to offset Soviet conventional forces. In the late 1970s, however, with the rise of Western anti-nuclear sentiment and the power of Moscow's own prodigious arsenal, NATO began to look into alternatives to nuclear weapons to deter a Soviet conventional attack.

Rather than attempting to match the Soviet massive armored vehicle production capacity, military strategists sought to pit the West's advantage in technology against Soviet numerical superiority. By the early 1980s, a disparate group of promising, but unproved, defense technologies began to be referred to collectively as "Emerging Technologies" (ETs).

Included in this grouping are advances in sensors, including millimeter-wavelength radar, electro-optical systems, and superconducting magnetic anomaly detectors; stealth signature reduction systems; advanced microprocessors; and advances in explosives and propulsion systems. The results promised to be a new generation of "smart" weapons, built upon the "fire-and-forget" missiles (*Sidewinder, Harpoon, Tomahawk*) of the 1970s. Referred to by some observers as "brilliant" or "launch-and-leave" weapons, this next generation of systems will be able to lock onto their targets after launch.

Korean Challenge. In the public debate on weapons technology in the 1980s, much attention has been paid to the potential impact of ETs, the feasibility of effectively utilizing them, and potential Soviet counter-measures. However, the entire debate has centered around the effect of ETs on the European Theatre, with precious little attention focused elsewhere. Since many of the weapons are being jointly developed, this is to be expected. But ET-based systems could prove beneficial to the U.S. military posture in many regions. An area of vital importance to U.S. national security that could be so affected is the Korean Peninsula.

The introduction of Emerging Technologies into the Korean Theatre poses a series of challenges to the United States and the Republic of Korea because of a rapidly changing international environment. Since the signing of the Intermediate-Range Nuclear Forces (INF) Treaty, the U.S. and its major allies have been discussing how far they may be willing to go in strengthening their current conventional deterrent forces, including ET-based systems. In addition, the entire political and defense relationship between the U.S. and the ROK currently is being subjected to intense scrutiny and possible revision within the next few years. Finally, the relationship between North and South Korea is in a period of flux, with Seoul increasing its overtures to Pyongyang for improved relations.

Roger A. Brooks is the Director of The Heritage Foundation's Asian Studies Center.

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It is within this political and military environment that the possible introduction of ET-based systems into the Korean Theatre must be viewed. To determine the usefulness of introducing such systems, three main points should be explored.

1) The major rationale for the development of ET-based systems, the expected capabilities of ET weapons, and the applicability of such weapons in Korea.

2) The precedents set by previous U.S.-ROK defense industrial cooperation that could serve as a model for the development and production of ET-based systems.

3) A brief overview of the current political and military constraints that might prevent any real move toward introducing ET-based systems into the Korean Peninsula.

RATIONALE FOR DEVELOPMENT OF ET-BASED SYSTEMS

While the U.S. has maintained very substantial non-nuclear forces, they have never been equipped to fight and win a major conventional conflict with the Soviets.[1] Instead, they have been designed for two basic purposes: 1) to provide a credible means with which to deal with contingencies short of all-out global war (for example, protecting international shipping in the Persian Gulf) and 2) in the event that deterrence fails, to buy time in the face of a Soviet onslaught to consider and exercise appropriate nuclear retaliatory options.

In recent years, this strategy has come under increasing assault. The Soviets' acquisition of their own sizable arsenal of nuclear weapons has called into question the military utility of NATO's threatened nuclear response to a conventional attack. Public opinion throughout the West reflects considerable antipathy to the threatened use of nuclear arms.

Partly in response to such factors, Western governments have adopted policies whose effect has been to diminish the moral and strategic underpinnings of nuclear deterrence. Particularly notable in this regard have been the Reykjavik Summit's emphasis on the elimination of nuclear weapons and the current preoccupation with arms control agreements.[2]

Overcoming the Impasse. As a result of the West's concern with the Soviet deployment of SS-20s in the 1970s and increased skepticism about NATO's forward defense and flexible response strategies, a limited consensus emerged in the first years of this decade for strengthening NATO's conventional defenses. At the same time, most NATO members faced the prospect of limited economic growth and actual reductions in available manpower which in light of the existing political climate reduced the likelihood of any dramatic increase in conventional capabilities.[3]

The application of advanced technologies that have been developed in the West over the past decade and a half offered one way to overcome the impasse. In some ways, the solution offered by Emerging Technologies to enhance NATO's conventional component corresponded with the potential solution offered by the Strategic Defense Initiative (SDI) to break the strategic impasse between the U.S. and the Soviet Union. By seizing the

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1 Frank J. Gaffney, Jr., "Bush, Dukakis Make Some Mistakes on Conventional Arms," *The Wall Street Journal*, September 27, 1988.

2 *Ibid.*

3 John A. Burgess, "Emerging Technologies and the Security of Western Europe," in Stephen Flanagan and Fen Osler Hampson, eds., *Securing Europe's Future* (Dover, Massachusetts: Auburn House, 1985), p. 64.

apparently unique technological and scientific advantages of the West, proponents saw the opportunity to enhance significantly NATO's conventional military capabilities with a minimum of political and economic dislocation.[4]

ASPECTS AND CAPABILITIES OF EMERGING TECHNOLOGIES

Central to the concept of ETs is the desire to counter the Soviets' numerical advantage in armor, aircraft, submarines, and air-defense systems through the use of innovative technologies. ETs are designed to increase the ability of allied forces to spot enemy units, and to reduce Soviet ability to do the same. They also are designed to increase the range and accuracy of anti-armor weapons and increase the number of targets engaged by a single weapon system. Among the most promising under development: stealth tactical aircraft; attack and reconnaissance drones; long-range, large-payload conventional missiles; scatterable mines and terminally guided submunitions.

History

During the 1970s, the West in general and the U.S. in particular acquired dramatic new capabilities in electronic data processing, communications, and sensors, which were not matched by corresponding developments in the Soviet Union. While not always intended for military use, much of this technology nevertheless had important military applications. In particular, the development of large-scale, and very-large-scale, integrated (LSI and VLSI) circuits made possible miniaturized, reliable, and inexpensive microprocessors with significant capabilities. Important improvements in software greatly increased the flexibility of newly developed hardware, combining to form a revolution in computer processing technology. This increase in capabilities was paralleled and greatly enhanced by contemporary developments in weapons technology.[5]

Standoff surveillance and attack capabilities also increased during the 1970s. Synthetic aperture radars, with moving target indicators, offered the possibility of detecting and tracking small, mobile targets at considerable distances. At the same time, developments in delivery systems, including improvements in terrain-following guidance for cruise missiles and more rugged and accurate inertial guidance for ballistic missiles, offered a means of delivering munitions over great distances with improved accuracy.

Small But Lethal. The combination of miniaturized processors with improved sensors made possible the precision guidance of munitions themselves. Thus, infrared homing sensors were introduced to permit imaging of infrared sources such as aircraft or tanks against natural background heat. At the same time, television, or electro-optical, guidance was perfected to provide improved image resolution. New systems based on laser-beam riding or semiactive homing were brought closer to practical application. Finally, millimeter wavelength radar, operating at wavelengths of no more than 10 mm and resistant to attenuation in fog, rain, or haze, offered a new means of accurate homing in bad weather conditions. These miniature and precise homing devices were complemented by corresponding improvements in explosives and propellants, arguably making possible significant increases in the lethality of quite small munitions.

With the increase in capabilities offered by ETs, military doctrines premised on these new technologies began evolving. In 1982, for example, the U.S. Army introduced a

4 *Ibid.*, p. 65.
5 *Ibid.*

corps-level doctrine known as "AirLand Battle," which places greater emphasis on maneuverability, made possible in part by advanced weapons. While envisioning a significant role for ET weapons around the FEBA (Forward Edge of the Battle Area), it also provides for "deep strikes" up to 150 kilometers behind enemy front lines.

Anticipating ET Advantages. A similar, but distinct, theatre-wide doctrine was approved by NATO in 1984 for interdiction of second and rear echelon forces. Known as FOFA (Follow-on Forces Attack), it contemplates much deeper strikes against choke points and armored forces up to 300 kilometers behind the lines. Deep strikes against enemy airfields also are contemplated by FOFA and the U.S. "Counter-Air 90" concept, albeit the latter was criticized by the Europeans as being too offensive in nature.

These military doctrines anticipate – with varying emphasis in each case – the three basic advantages of ETs:

1) Advanced sensors and delivery systems that reach far behind enemy lines, making possible precision deep strikes without the use of manned aircraft, particularly against heavily defended Main Operation Bases (MOBs).

2) Signature reduction technology, which would enhance the survivability and lethality of manned aircraft and other airborne systems.

3) "Smart" weapons and terminally guided submunitions to reduce dramatically the Soviet Bloc's numerical advantage in armored vehicles.[6]

Anti-Armor

Designed to bear the brunt of mass tank attacks, this category includes standoff missiles, which release autonomous bomblets that seek out tanks and other armored vehicles. Systems currently under development include:

SANDARM (Search and Destroy Armor). This U.S. Army program seeks to give artillery and the Multiple-Launch Rocket System (MLRS) the capability to attack moving armored vehicles by the early 1990s.

HVM (Hyper-Velocity Missile). Developed by LTV, the HVM is designed as a low-cost, air-and-ground-launched standoff weapon, with both Air Force and Army/Marine Corps versions.

MSOW (Modular Stand-Off Weapon). Developed as a multinational cooperative program, MSOW will include an entire family of delivery systems, both long- and short-range, with either unitary warheads or submunitions.

TMD Tactical Munitions Dispenser). Similar in function to the Army's SANDARM program, this Air Force project envisions a 1,000-pound dispenser releasing ten submunitions, each of which releases four "Skeet" IR-guided anti-armor warheads, offering the potential of multiple tank kills per pass.

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6 *Ibid.*, p. 67.

TGSM (Terminally Guided Submunition). Developed by a four-nation team, three TGSMs will be dispensed by existing MLRS rockets.

RMS (Remote Mining Systems). Utilizing the newly available MLRS and conventional artillery systems, the ability to lay mine fields in front of and behind enemy lines has been dramatically improved with ETs.

APGM (Autonomous Precision Guided Munition). Essentially a 155-mm artillery version of the MLRS's TGW, initial contracts for the expanded feasibility stage of the APGM are expected to be awarded in April.

Deep Strike

Such systems, designed to hold enemy rear areas at risk, would target C^3I installations, vehicle depots, airfields, SAM sites, and vital infrastructure sites such as bridges, radio towers, water and fuel tanks. Systems under development include:

MSOW (Modular Stand-Off Weapon). The same delivery system as the anti-armor version (mentioned above) but equipped with two different payload packages (unitary and submunition) to target units deep behind enemy lines.

DAACM (Direct Airfield Attack Combined Submunition). Designed as a follow-on to the French-built *Durandal* anti-airfield weapon. Potentially utilizing the long-range version of the MSOW, the DAACM would deploy eight Textron Bomb Kinetic Energy Penetrators for runway cratering and 24 British HB-876 area denial mines to inhibit runway repairs.

ARM (Anti-Radiation Missile). While not classified purely as a deep-strike system, recent developments in ARM technology has placed enemy Surface-to-Air Missile (SAM) sites at greater risk than in the past. Building on the lessons learned in Vietnam and the Arab-Israeli wars, the latest addition to the ARM inventory has been the development of long-range attack RPVs or "harassment drones" — of which *Tacit Rainbow* is the U.S. entry.

Air Operations

These systems would be designed to improve U.S. ability to conduct air operations by reducing the effectiveness of enemy air defenses. The use of stealth radar signature reduction technologies, for example, will limit the Soviets' ability to both acquire and attack U.S. aircraft, and other stealthy systems. In addition to stealth, air operations will be enhanced by continuing efforts at IR signature reduction, new active radar systems that reduce counterdetection, laser communication systems, and "smart skin" aircraft coatings. When these technological developments are combined with low visibility paint schemes and low-level flying tactics, aircraft survivability will be greatly enhanced.

Anti-Air Operations

These systems are designed to limit the enemy's ability to conduct air operations and to enhance allied ability to overcome Soviet radar-signature reduction efforts. This would involve the use of improved detection systems, potential employment of battlefield lasers to destroy enemy aircraft and missiles, increases in the range and accuracy of anti-aircraft weapons, and the use of "smart" and "brilliant" guidance systems for both air-to-air and Surface-to-Air Missiles. Included in this category are systems designed to limit the enemy's ability to destroy allied defensive positions. A system to protect fixed SAM sites from Anti-Radiation Missile attacks through the use of a *Phalanx*-based defense system is envisioned, most certainly motivated by fears of the Soviets producing a loitering anti-radar missile similar to the U.S. *Tacit Rainbow*.

Command, Control, Communications and Intelligence (C^3I)

In order to fully utilize the precision attack capabilities of the fewer (but "smarter") weapons available, enhanced remote intelligence-gathering, data processing and communications systems will be vital. Proposals include:

> JSTARS (Joint Surveillance Target Attack Radar System). In order to fully engage enemy units prior to their arrival at the front lines, their precise location must be determined and communicated to ground forces in a timely manner. JSTARS is designed to perform that mission.
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> **Laser Communication Systems.** Three primary applications for laser communications currently are being investigated by the Department of Defense: Aircraft- or Satellite-to-Submarine, Aircraft-to-Aircraft, and Satellite-to-Satellite. The main advantages of laser over radio frequency (RF) communications are higher data transmission rates and wider bandwidth; reduced beam divergence, reducing chance of message interception; smaller antenna size, important for satellite applications.

APPLICABILITY OF ET-BASED SYSTEMS TO KOREA

The military situation on the Korean Peninsula bears many similarities to the Central Front in Europe. Therefore, many of the same arguments that support using ET-based systems in the NATO context could be used in the Korean Peninsula. Like the Allied forces in Western Europe, the U.S. and South Korean forces in the Combined Forces Command on the peninsula face a numerically superior armored threat from a Soviet Bloc state that could quickly take the offensive in any armed conflict. Also as in Europe, the U.S. maintains the option of using nuclear weapons, if conventional forces cannot contain an attack from the North. In both Europe and Korea, moreover, the U.S. can expect a massive, combined attack, which would leave little time for defensive mobilization or response.

Dissimilarities between the situations in Europe and the Korean Peninsula include the fact that the Soviets and the Chinese have not provided Pyongyang's military the same kind of qualitative improvements that the Soviets have provided to the Warsaw Pact armies along the Central Front; the ability to which amphibious operations can be used by North Korea to circumvent fixed defenses and the difficulty of their use in the European theatre; the lack of fall-back potential, since Seoul is only 31 miles from the Demilitarized Zone

(DMZ), which gives U.S. forces in Korea even less of a margin than they have in Europe; and the degree to which Pyongyang's offensive forces would be "front-loaded," thus reducing the utility of the U.S. Europe-based FOFA doctrine, which relies heavily on the engagement of enemy rear areas.

One Million Troops. Unlike Soviet allies in Central Europe, the North Koreans still rely on many older ground systems, although modernization of their air and naval systems progresses apace. However, Pyongyang still maintains a credible ground threat in the Korean Peninsula with 750,000 active ground force personnel and 3,200 heavy and 300 light tanks. In addition, there are some 540,000 reservists with 12-hour mobilization commitment, and about 5,000,000 with some commitment to the reserves or militia. In fact, recent estimates on the number of North Korean military personnel, revised upwards to total over one million men on active duty, bring into question the ROK's ability to achieve strategic parity in the near future.

In addition to maintaining impressive overall numbers, the North Koreans have the ability to rapidly mobilize their forces for a surprise attack. They also have improved their amphibious and special forces operations, both of which are cause for continuing concern on the part of the U.S. and the ROK. The main advantages of ETs in the Korean Theatre would be:

1) The improved ability to detect a North Korean attack.

2) The increased ability to halt an armored assault across the DMZ.

3) The improved ability to conduct air operations over DPRK territory and the ability to threaten Pyongyang itself.

4) The neutralization of North Korea's air threat.

Some of the specific systems that could be deployed in the Korean Theatre by U.S. units are: anti-armor, such as artillery and MLRS-based weapons, including SANDARM and SKEET submunition and remote mining systems; airfield suppression, stand-off missiles and cratering submunitions, including DAACM; and such surveillance as enhanced early warning systems, including new airborne radar platforms.

Early Warnings. Since surprise is crucial to a successful North Korean assault, early warning systems, in particular, are vital for the successful defense of the ROK. Currently, the U.S. operates an Early Warning/Air Defense Center at Osan Airbase, several miles south of Seoul, which is integrated with the Japan/Okinawa Air Defense System and controls the Airborne Warning and Control System (AWACS) aircraft and naval E-2C *Hawkeyes*.

In the event of hostilities, however, the ROK's airfields would quickly be put at risk. Faced as well with an expected large number of enemy fighters and the hostile Surface-to-Air Missiles, these assets could be put in too much danger to operate effectively. A valuable complement to existing systems could be some kind of airborne early warning Remotely Piloted Vehicle tethered or mobile radar-equipped blimps, or a combination of the three, which – although vulnerable – could be stationed close to the DMZ and provide invaluable warning time in alerting the Combined Forces Command of a surprise attack.

The U.S. Navy is currently developing a radar-equipped blimp to be used for detection of aircraft, cruise missiles, and using towed detection devices, mines and submarines.[7]

ET-based systems could help improve the balance of forces in the Peninsula by offsetting the North's numerical superiority, thereby improving overall Allied deterrent capability. Some have argued they could also decrease reliance on nuclear weapons as a deterrent to North Korean aggression, although this area has not yet been widely discussed.

Promoting "Division of Labor." Some Korea observers have also suggested that the introduction of ET-based systems into the Korean environment could promote a better "division of labor" between the forces of the U.S. and those of the ROK, drawing upon the concept of "Competitive Strategies" developed by DoD's Office of Net Assessment Director Andrew Marshall. This could move along the process that already has begun, providing greater responsibilities to the ROK forces and putting U.S. forces in a role that takes advantage of both ROK and U.S. strengths.

With the addition of tested and proved ET-based systems, the ROK Army theoretically could focus on blunting the main armored assault, while U.S. forces would provide airborne early warning, air superiority, airfield suppression, artillery support, and naval operations. The U.S. Forces in Korea also could assume a greater regional role while the ROK would concentrate on defending against an assault from the North.

This last matter raises the question of the status of U.S. forces in Korea and whether the idea should be entertained that the introduction of advanced ET-based systems into the Korean Theatre could serve, in any way, to replace the presence of U.S. forces.

U.S. Troop Reductions. Historically, the U.S. has reduced its military presence as developments have allowed. Between 1954 and 1955, President Eisenhower removed six of the eight U.S. divisions stationed in Korea, confident that the North's reconstruction effort would prevent renewed hostilities. In 1971, President Nixon, in light of the ROK's economic and military development in the 1960s and confident that the USSR and the PRC would restrain North Korean actions, pulled out another division, leaving a single infantry division in the ROK. Prior consultations and mutual agreement are an important precursor to any U.S. decision, as President Carter's abortive attempt to phase out U.S. troops in 1977 proved. In fact, the ROK has resisted each of Washington's attempts to reduce U.S. force levels, even though the deactivated units turned their weapons over to the ROK Army, which assumed the mission of the U.S. forces.

Most analysts believe that, before the end of this century, the ROK probably will achieve rough military parity with the North, although the most recent figures provided on North Korean troop strength indicate possible complications to this. A point that should not be lost is that, regardless of the status of the Second Infantry Division, there is a strong desire in the ROK for the U.S. to remain, at least for the foreseeable future. Few Korean officials forget that the last time the U.S. pulled all of its forces out of Korea, the North invaded.

Thus, any deployment changes that could be facilitated by ET-based systems should be considered within a larger political framework. The changes should not be seen as a reduction of the U.S. commitment to defend the ROK against potential aggression from the North, but as a change that eventually could hand over greater responsibility for the defense of a free Korea to the forces of the ROK and upgrade their combat power. This

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7 Malcolm W. Browne, "U.S. Turns to Giant Blimp for Defense of the Nation's Shores," *The New York Times*, January 10, 1989, p. C1.

could serve as a solution both to rising anti-Americanism and to Korean fears of a lack of U.S. resolve.

Given the current military circumstances and the considerable threat the North still poses to South Korea, it is not now appropriate to discuss lowering U.S. troop strength in Korea. ROK President Roh Tae Woo recently confirmed that the situation does not warrant a change in the U.S.-ROK defense relationship.

U.S. - ROK DEFENSE INDUSTRY COOPERATION

Clearly, there are precedents for U.S.-ROK defense industry cooperation, which could be applied to future potential cooperation in the production of various kinds of Emerging Technologies. Following the Third U.S.-ROK Defense Industry Conference, held in May 1988, for example, an agreement was reached that the U.S. and the ROK would carry out cooperative R&D in five areas, notwithstanding serious differences over issues such as offsets and exports. The five areas, surface-to-air missiles, C^3I, coastal water antisubmarine warfare, munitions, and remotely piloted vehicles, form part of the Defense Technological Cooperation Memorandum of Understanding (MOU). This MOU was signed by U.S. Secretary of Defense Frank Carlucci and Korean National Defense Minister Oh Ja Bok at the U.S.-ROK Security Consultative Meeting which took place in June of 1988.[8]

One of the major issues causing disagreement between the two sides is the export of high technology. U.S. industrialists clearly are concerned that transferring high technology to any country, not just Korea, to enable them to build up a sophisticated defense industry ultimately will harm U.S. companies' own prospects in the export market.

Demanding Freedom from Restrictions. In general, countries like Korea can manufacture products far more cheaply than the U.S. and are thus more competitive in Third World markets. To date, transfer of technology from the U.S. usually has meant that the receiving nations had to abide by laws passed by the U.S. Congress whenever they applied for export licenses.

Increasingly, however, countries like Korea, which, by their own admission, do not have high-tech research and development capabilities but do have the industrial means for the manufacture of high technology, are demanding freedom from the restrictions imposed by the United States.

Brigadier Kim Sung Cho, addressing the May 1988 Conference, pointed out that, while the U.S. was eager to assist the ROK in setting up its own defense industry, events in world markets since the early 1980s had prompted the major defense manufacturing countries to turn to quasi-protectionist measures, and the U.S. was no exception. In effect, the U.S. approved only 5 percent of the applications Korea made for export of defense material in recent years.

Trying Test. The future of U.S.-ROK defense cooperation may receive its most trying test in the proposed F-X fighter program. For Korea, the first step in getting an aerospace industry off the ground is developing the production, management and design technologies required for such a program. Since 1983, Korea's F-X program has planned to put this infrastructure into place by producing an advanced fighter aircraft under license from a foreign partner, which today is the U.S.

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8 Chris Jenkins, "U.S.-Korean Cooperation: The More the Merrier," *Military Technology*, October 1988.

The current U.S. candidates for the F-X program are the General Dynamics Corporation's F-16 single-engine fighter and McDonnell Douglas's twin engine F/A-18 fighter. In 1981, Korea purchased 32 F-16s from General Dynamics through a government-to-government foreign military sales (FMS) program. The purchase of the F-16s, however, does not necessarily give General Dynamics an edge in its bid for the F-X program. Most national air forces typically have a wide mix of aircraft in their force structure. Therefore, Korea could decline the F-16 as a basis for U.S.-ROK industry cooperation, since Seoul is intent on developing a fully capable aerospace industry that can expand its expertise through this project.

Seeds of Doubt. Whatever the outcome in the F-X selection process, U.S.-ROK cooperation in this project may be complicated by the seeds of doubt that have been sown in the U.S. Congress concerning U.S. cooperation with Japan in development of the FS-X fighter aircraft.

The introduction of ET-based systems, whether in NATO or in the Korean Theatre, also will cause special procurement difficulties that must be resolved if the potential of Emerging Technologies is to be fully realized. In NATO, the U.S. historically has been most active in promoting defense industry cooperation. Yet despite a few bright spots, military circumstances and economic pressures have resulted in duplicative hardware programs, especially for those weapons involving significant national prestige and investment.

That record is likely to be exacerbated by the introduction of ET-based weapons because 1) the U.S. is uniquely dominant in such technologies; 2) historically, efforts to collaborate in high technology weapons have proved especially vulnerable to failure, in part because of the export restriction problems just mentioned; and 3) despite some efforts in NATO, the lack of a coordinated NATO-wide ET procurement policy already has spawned a wide range of overlapping systems.

The issues of technological participation of countries like Korea in cooperative defense programs and their export of U.S. technology to third countries are far from being resolved. And it does not appear likely that countries like the Republic of Korea will be attracted to participation in the development and production of ET systems until such issues are resolved.

REMAINING QUESTIONS ON ET DEPLOYMENT

There are several issues that need to be resolved before taking the bold step to recommend the introduction of appropriate ET-based systems into the Korean Peninsula.

First, the question of overall military effectiveness. Specifically, can Emerging Technologies be translated into significant military advantage?

The problems of relying on technological superiority were eloquently stated by Dr. Steven Canby three years ago in *International Defense Review*. He observed that technological advantage is transitory in nature, readily copied, and readily countered.[9] Canby also pointed out that large payoffs require changes in strategy, doctrine, and organization, which may take years to recognize and still more to be adopted by opponents.

9 Steven L. Canby, "The Operational Limits of Emerging Technology," *International Defense Review*, May 1985, p. 875.

New technologies, Canby stated, will change the techniques by which things are done in war, but they will not change either the nature of those activities, such as intelligence gathering, commanding, striking, protecting, and moving about, or the principles by which they are performed, such as surprise, concentrating forces, economy of forces, and security.

Movement and Elusiveness. Nor can the new technologies be expected to benefit the defense over the offense. Sensing technologies, such as those that are used in some ET systems, would appear to favor the defender, who is well entrenched, while the attacker must move and thereby be exposed. In the current age of firepower dominance, however, the defense, too, is based on movement and elusiveness. If not, the defense will be overwhelmed by fire, enveloped or defeated in detail by forces with greater initiative.

For these reasons, more work needs to be done to clarify the doctrines that have been developed to employ the kinds of ET-based systems herein discussed. *New Technology for NATO: Implementing Follow-On Forces Attack*, a study recently completed by the U.S. Congress's Office of Technology Assessment, provides a good start in this direction. A similar study evaluating the possible employment of ET systems outside the European Theatre, and particularly in Northeast Asia, is a necessary precursor to any decision to use those systems outside NATO.

Different Roles. Second, there is a question of whether the U.S. should even contemplate the introduction of ET-based systems into such an area as Korea as part of a plan to reduce the direct role of U.S. forces there. A reduced direct role of U.S. forces in the Korean Peninsula could result from the employment of ET-based systems in the area, based on a well-constructed strategy for their employment, but this should not be the major rationale for the use of these systems. The current direction of the U.S.-ROK relationship will probably and eventually lead to different roles for the U.S. and ROK forces than those they now maintain—whether or not ET-based systems are introduced to the region.

Third, both the ROK and the U.S. should address the question whether the introduction of any new weapons systems into the Korean Peninsula, particularly those in the category of Emerging Technologies, could affect the current political environment. Talks have been taking place between Pyongyang and Seoul on a variety of questions, including reduction of tensions between the two Koreas, possible expansion of trade and travel contacts between the two, the possible normalization of relations and, of course, eventual reunification. Whether these talks will bear any fruit remains to be seen. But what is not apparent is that these talks are politically valuable to both Pyongyang and Seoul. If that value is to be maintained, both Koreas probably will wish to examine very carefully the possible introduction of any new, technologically advanced systems and weigh that against the political costs that might be incurred if it were to happen in the current environment.

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