Chapter 6

Japanese Defense Industrial Policy and U.S.-Japan Security Relations

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INTRODUCTION AND OVERVIEW

Over the past 30 years the U.S.-Japan bilateral security relationship has been directed toward the potential threat posed by the Soviet Union and other Communist powers in East Asia. Now that the Cold War has ended, there are strong political pressures on Japan, both internal and external, to reduce defense spending. However, many Japan Defense Agency (JDA) officials believe that qualitative improvements have offset quantitative reductions in Soviet forces in the region. Indeed, some believe that greater uncertainties in international relations argue for retention of increased self-defense capabilities. Others argue, instead, that Soviet aggressiveness is reduced and that Japan must moderate its defense budgets accordingly. These differences have led to an intense policy debate within Japan over the appropriate types and levels of defense spending.

A number of factors complicate long-term planning and create doubts about the future of the bilateral security relationship with the United States. Perhaps most important, the United States is sending mixed signals to Japan regarding its intentions in the region. On one hand, the United States continues to pressure Japan to assume more of the cost of its own defense. Many Japanese officials view this as an indication that the United States may not remain fully committed to the bilateral security treaty,[1] producing uncertainty for Japan and justifying additional defense spending. Japan's reluctance to provide support for the United States in the Persian Gulf War has highlighted what many in the United States still feel is a free ride on defense for Japan. On the other hand, when Japan *does* slate money for defense, this is sometimes criticized in the United States, in part because it is viewed as being driven by economic factors, not genuine security concerns. This claim was a prominent element of the Fighter Support Experimental (FSX) debate and remains a critical consideration in discussions of cooperative projects with Japan.

The increased emphasis given economic issues by the United States is exerting considerable stress and may eventually undermine the security relationship with Japan. Previous administrations had pursued economic and defense issues in isolation, in order to ensure that economic frictions did not harm security cooperation. With the Bush Administration, such a separation no longer appears possible. Indeed, security increasingly is defined in economic terms by the United States, leading to apprehension in Japan that the United States will reduce opportunities for cooperative programs and that existing efforts, notably the FSX, will be delayed.

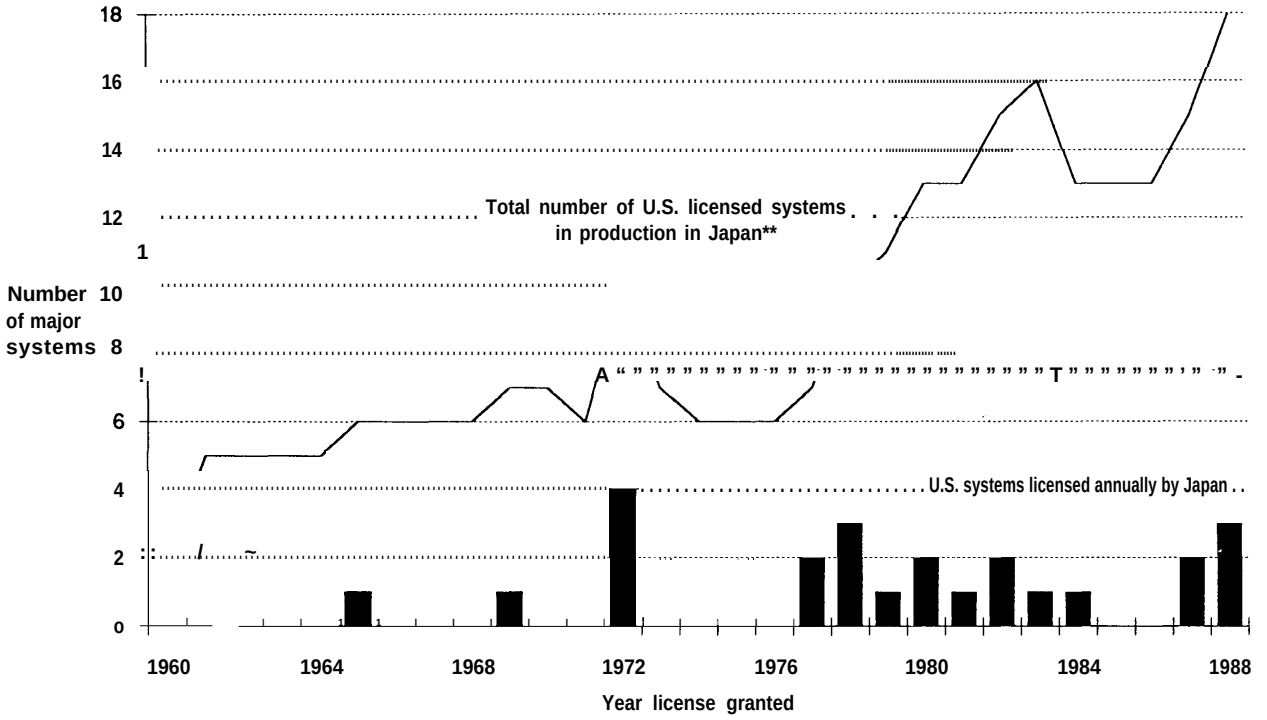
Collaboration in military technology with Japan has been a one-way street for decades. Massive technology transfers have taken place from the United States to Japan under existing programs (see figure 6-l). Licensed production of a variety of types of U.S. military aircraft has contributed to the development of a core of Japanese companies skilled in diverse aspects of aircraft production.[2] These programs have also stimulated critical industries such as electronics and materials through generous technology transfers.

In the past, U.S. policymakers have recognized the economic implications of these transfers but felt they were justified because of their military benefits. Recently, however, the economic disadvantages of those programs have been viewed in a more critical light. For example, the FSX fighter codevelopment program remains controversial. The failure to produce a two-way technology flow has led to a broad questioning of the value of these programs to the United States. More importantly, cooperative defense production programs, coupled with indigenous efforts, have transferred to Japan a high degree of self-sufficiency in defense production.

[1] The Treaty of Mutual Cooperation and Security of 1960. A second fundamental document enabling U.S.-Japan defense cooperation is the Mutual Defense Assistance Agreement (MDAA) of 1954. For the purposes of this discussion, references to the security treaty will mean either the 1960 treaty, the MDAA, or both.

[2] Aircraft produced in Japan include the Bell UH-1H Heuy helicopter, the Bell AH-1S Cobra helicopter, the Lockheed P-se Orion patrol airplane, the Boeing 107 Model II helicopter, the Boeing CH-47 Chinook helicopter, the McDonnell Douglas Model 500D helicopter, the McDonnell Douglas F-4E Phantom jet fighter, the McDonnell Douglas F-15J and F-15DJ Eagle jetfighter, and the Sikorsky S-61, S-61A, and S-61B helicopters.

Figure 6-l—Estimated Japanese Licensed Production of U.S. Major Conventional Weapon Systems,* 1960-88



● Japan license-produced major systems only from the U.S.
'Estimates based on the assumption that an average system is produced under license for 12 years.

SOURCE: Office of Technology Assessment, from data in Stockholm International Peace Research Institute, SIPRI Yearbooks 1970 through 1990, World *Armaments and Disarmament.*

Japanese defense planners argue that the momentum achieved over the past decade must be continued in order to assure minimum self-defense capabilities. Japanese industry has invested heavily in defense production and would like present funding levels continued to allow sufficient time to restructure in the event that greater spending becomes politically unsupportable.

The outcome of these deliberations will affect Japanese security policies for at least the next decade. The defense buildup that has taken place over the past 15 years resulted from a carefully crafted set of compromises. Reversing or modifying those compromises could require an equally broad political consensus that will influence defense budgets in the future. Abrupt fluctuations in Japan's defense budget, either toward expanded or reduced funding, are unlikely given the domestic political process.

Several large-scale procurement projects will be affected by this debate, including full-scale production of the FSX fighter aircraft, licensed production of the Multiple Launch Rocket System (MLRS), acquisition of Airborne Warning and Command Systems (AWACS), over-the-horizon (OTH) radar, and mid-air refueling tankers. Domestic development programs could also be affected, although industry and JDA are both lobbying for higher R&D spending. Some companies have already begun adjusting their production strategies. The domestic Japanese defense market could be restructured significantly in the coming decade.

Japanese industry lacks incentives to share technology with the United States in collaborative defense programs. For Japanese firms, technology is viewed as a precious commodity that should not be licensed indiscriminately but should be accessed and absorbed whenever possible. Japanese industry views the United States as the competition, so the motivation to cooperate by transferring technology reciprocally is limited. American interest in collaborative projects is also uncertain; the continuing difficulties associated with the FSX project have generated resentment in both countries.

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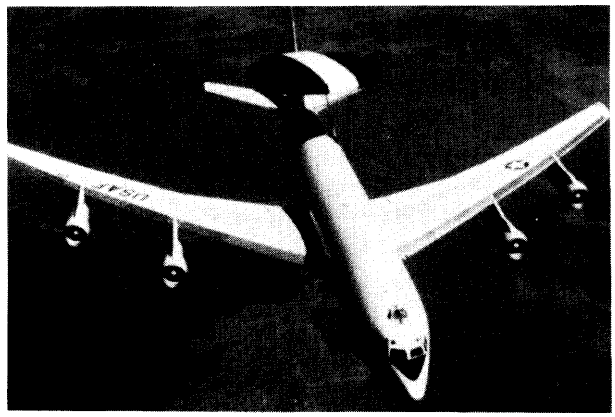

credit: Dep tmen Defens

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The FSX experience is pushing industry and government in Japan toward even greater reliance on domestic capabilities. Several independent R&D projects have been launched, aimed ultimately at self-sufficiency in complete systems and toward enhancing negotiating leverage vis-a-vis the United States and other potential foreign partners. These include a medium-range, surface-to-air missile to replace the U.S.-designed Hawk and computers to replace IBM computers in the F-15 fire control system.

Japan continues to prohibit the export of complete weapon systems. This policy is likely to remain intact for the foreseeable future, because it involves fundamental foreign policy considerations, not simply economic factors. However, it is likely that Japanese firms will exert increasing influence on defense policies in the future because defense development will rely increasingly on dual-use technologies whose control by government policies remains unclear.

Despite pressure to liberalize defense exports from some defense producers, the government of Japan enforces a prohibition against exporting complete defense systems. Component exports are another matter, especially for components embodying dual-use technology. Even though constraints on the export of complete weapon systems might remain in effect for decades to come, Japanese firms could still build a sizable defense-related business through component exports. This could take place without a change in current government policies.

THE COLD WAR IN ASIA AND JAPANESE SECURITY DEBATES

A framework of policies has resulted in 15 years of steady but limited growth in Japan's defense capabilities. These policies are now coming under scrutiny as Japan debates whether the security environment for the coming decades will grow more or less hostile.

A Brief Review of Japan's Defense Policy

In Arming Our Allies, OTA published **a detailed** analysis of Japanese defense policy. The principal elements of that policy are summarized below.[3]

. Article 9 of the Constitution. The so-called ''no war clause' that renounces the use of force to settle international disputes. Japanese pacifism and Article 9 have reinforced one another since the end of World War II.

[3]See U.S. Congress, Office of Technology Assessment, *Arming Our Allies: Cooperation and Competition in Defense Technologies,* OTA-ISC-449 (Washington, DC: U.S. Government Printing Office, May 1990), ch. 4.

- Reliance on the United States for defense. The laws that govern Japan's defense establishment prohibit the country from entering into collective security agreements. The bilateral security treaty with the United States is the only defense or security agreement entered into by the government since the end of World War II. Although calls have been issued to reevaluate the treaty,[4] it still serves as the basis for the bilateral security relationship. Forty-five years of practice have led the Japanese defense community to rely heavily on the United States for planning, equipment, technology, and other aspects of its overall defense structure.
- Restrictions on the use of military forces. These include legislative prohibitions, constitutional provisions and/or cabinet statements prohibiting overseas troop deployments? limiting weapon procurements to defensive systems (as opposed to offensive weapons), and banning a military draft.
- The nuclear prohibitions. Japan has opposed the possession, introduction, or manufacture of nuclear weapons. This policy is supported both by legislation (e.g., in the Atomic Energy Law) and Cabinet policy statements. Equally strict prohibitions exist for the manufacture of biological and chemical weapons.
- Weapons export limitations. As a matter of policy Japan does not export weapons, military technology, or weapons manufacturing capabilities to other countries. However, because the Japanese definition of weapons is narrowly drawn, the policy has been weakened by the expanding use of dual-use technology in weapon production. Nevertheless, this policy has effectively curtailed exports of complete weapon systems and remains a fundamental element of Japan's security posture.
- Peaceful uses of space. Japanese policies call for the peaceful use of space. Its participation in Strategic Defense Initiative research is viewed as consistent with this position.
- Quantitative spending limitations. In 1976, the Cabinet instituted a spending cap on total Japanese defense spending by stipulating that the defense budget could not exceed 1 percent of that fiscal year's estimated gross national product (GNP). This provision was eliminated in 1986, and was replaced by quantitative acquisition levels stipulated in 5-year defense procurement plans. In practice, however, spending is still limited to about 1 percent of GNP. Because of intense policy debates now under way in Japan, it is possible that explicit spending restrictions could be put into effect again.

Japan's defense policymaking has also been affected by government policies emphasizing economic development over rearmament, and by differing views of the external threat throughout the postwar period. At the end of World War II, Japan's economy was devastated, and economic recovery was the highest priority. U.S. defense collaboration policies with Japan sought in part to further this economic development by contributing to indigenous defense production capabilities through licensing programs.[6]

The 1976 National Defense Plan outline established a common rationale for defense procurement in the subsequent decade and, for all practical purposes, issues of threat perceptions were set aside. Japanese views toward the Soviets hardened in the early 1980s, however, particularly with the invasion of Afghanistan and the Soviet downing of civilian Korean Airlines flight 007 in 1983. However, with the dramatic changes that have taken place globally, especially in Eastern Europe, these attitudes towards the Soviets are now being reappraised.

The Japan Defense Agency insists that the Self-Defense Forces must maintain their current capabilities in the event that changes in the Soviet Union are not permanent. Defense officials note that while Soviet force levels might decline in the Asian region, the quality of those forces remains high and continues to pose a military threat to Japan. They add further that the present levels of Japanese defense capabilities were outlined in 1976, a period during which the government had officially anticipated a

[4]See, for example, Keiichi Kawanashi, "Time To Re-Examine the Security Treaty, " *Japan Economic Journal,* Apr. 21, 1990, p. 9; Chikayo Mogi, "Growing Doubts Over Security Treaty With U.S.," Kyodo News Service, cited in Foreign Broadcast Information Service, *Daily Report: East Asia,* FBIS-EAS-90-118, June 19, 1990, p. 1; "Rethinking the Japan-U.S. Alliance," *Japan Echo,* vol. 17, No. 1, 1990.

[5]The Kaifu Government withdrew legislation introduced in late 1990 to allow overseas deployment of noncombatants from the Self-Defense Forces in peacekeeping operations organized and sanctioned by the United Nations.

[6]U.S. Congress, Office of Technology Assessment, op. cit., footnote 3, pp. 61-62.

continuation of detente between the superpowers,[7] and thus more, not less, defense expenditure is required.

JDA and other parts of the government may also wish to hedge against planned U.S. troop reductions in Japan in case they lead to a long-term trend toward total withdrawal from the country. In February 1990, Secretary of Defense Richard B. Cheney reassured Japan of the U.S. commitment to the country and the region as a whole despite plans to withdraw 10 percent of the U.S. military forces from Asia.[8] In either case, continued U.S. retraction would force Japan to assume a greater share of its defense requirements.

These views are not held uniformly throughout the Japanese Government. In mid-1990 Prime Minister Toshiki Kaifu took the position that the Soviet threat facing Japan no longer warranted the spending increases of the past 15 years (see table 6-l). He instructed JDA to take "changes in the international situation" into account in preparing its 1991 budget. Consequently, Japan's defense spending in fiscal year 1991 will rise only 5.5 percent.[9] While this amount was still high, it represented a symbolic victory for the Kaifu Government, as JDA had sought a 6- to 7-percent increase. Furthermore, the government decided not to initiate major new procurement programs for at least another budget cycle.

Table 6-l-Japan's Defense Budget, Fiscal Years 1955-90 (billions In current yen)

	Budget (Yen, billions)	Percent change from previous year	Percent of GNP
1955	134.9	-3.3	1.78
1965	301.4	9.6	1.07
1975	1,327.3	21.4	0.84
1980	2,230.2	6.5	0.90
1981	2,400.0	7.6	0.91
1982	2,586.1	7.8	0.93
1983	2,754.2	6.5	0.98
1984	2,934.7	6.6	0.98
1985	3,137.2	6.9	0.98
1986	3,343.6	6.6	0.99
1987	3,517.4	5.2	1.00
1988	3,700.3	5.2	1.01
1989	3,919.8	5.9	1.06
1990	4,159.0	6.1	0.99
1991[a]	4,402.3	5.5	0.99

[a]Budget request submitted to Ministry of Finance by Japan Defense Agency, pending Cabinet approval.

SOURCE: Japan Defense Agency, Defense of Japan (various editions).

The Defense Budget Outlook

The 1991 budget initiates a new 5-year defense procurement plan that will increase defense spending in real terms by an average of 3 percent annually for the 5-year period. Despite the insistence that front-line equipment will be reemphasized in the coming plan, a number of new systems are under consideration. These include Boeing E-3 AWACS, mid-air refueling tankers, additional Aegis systems, and MLRS, probably under a licensed production arrangement involving the U.S. firm LTV and Nissan Motor Co. It is possible that a production decision on the FSX fighter aircraft will also be reached. Two important coproduction programs will end during the 5-year period: the McDonnell Douglas/ Mitsubishi Heavy Industries F-15J program, and the Lockheed/Kawasaki Heavy Industries P-3C program. The end of both programs will have a significant effect on domestic companies.[10]

Planning is further complicated by the continued sensitivity surrounding defense discussions, particularly with respect to the United States and the U.S. Congress. The negative publicity and arduous negotiations surrounding the FSX project caused Japanese government and business interests to feel that the U.S. Government dealt poorly with Japan by insisting on revisions in the agreement reached by the Reagan Administration. For Japan, the FSX was a fait accompli that should not have been re-

m. Mizuoka, " "Heiji Taisei' Iko e no Shomondai" ("Various Issues Related to the Transition to a 'Peacetime Posture' "), *Gunji Kenkyu (Japan Military Review)*, September 1990, vol. *25, No. 9,* pp. 20-40.

[8]A lo-percent reduction in forces would amount to 12,000 troops. Of these, 5,000 to 6,000 are expected to be withdrawn from Japan, leaving approximately 50,000 U.S. servicemen in the country. The strategy behind these plans is outlined in U.S. Department of Defense, Office of the Secretary of Defense, "A Strategic Framework for the Asian Pacific Rim: Looking Beyond the 21st Century," 1990, Secretary Cheney's speech to the Japan National Press Club of Feb. 23, 1990, can be found in Hon. Richard B. Cheney, "To Remain in Asia," *Speaking of Japan*, vol. 11, No. 114, June 1990, pp. 1-8.

[9]Barbara Wanner, "Growth in Defense Spending Trimmed," *JEI Report, No. 30B,* Aug. 3,1990, p. 5; "Tokyo Slows Down Defense Buildup Amid Global Changes," *JEI Report, No.* IB, Jan. 11, 1991, pp. 8-11.

[10]Budget drafters could maintain current spending levels by stretching payments for major systems over longer periods than is now common. Typically, JDA pays for a system over a 4-year period. That period could be extended to 5 or 6 years in order to keep current outlays under control. This would generate huge future obligations, however, which would strain future budgets.

Photo credit: U.S. Department of Defense

The F-15E **is claimed to be the world's preeminent fighter currently in production. The McDonnell Douglas/ Mitsubishi F-15J and F-15DJ program, which began in 1980, is slated to end during the 1991-98 Japanese defense procurement plan when FSX production is supposed to begin.**

examined. Congress' response to the FSX case was viewed as protectionist and at times motivated by racial fears or prejudices.

At the core of the defense budget debate is a reevaluation of the U.S.-Japan security relationship. The reduced threat now posed by the Soviets invites policymakers to reexamine the bilateral security treaty and the security relationship it represents. Some critics have called for the abolition of the mutual security treaty while others have urged a greater focus on its economic security considerations. (Article 2 of the treaty in fact states that its purpose is to promote the economic well-being of both signatories.) Furthermore, a wide range of regional security concerns remain that could provide valid reasons for continuing without change the present security relationship.

While the Japanese Government remains officially confident of the ability of the United States to extend its military protection to Japan, questions arise over the credibility of the U.S. deterrent in light of its economic problems.[11] The U.S. Government continues to call for JDA to assume greater defense responsibilities (in the Persian Gulf War, for example) and to assume vacancies left by U.S. forces in Japan. To some Japanese defense officials, both of these trends justify higher defense spending and also cast doubt on the role of the bilateral security treaty.

The United States has announced selective troop reductions, but has reiterated its commitment to Japan in particular and to Asia as a whole. The United States remains aware of its role as the honest broker in the region and that significantly expanded Japanese defense capabilities would be viewed as a threat by other nations in the Western Pacific.

THE MARKET FOR DEFENSE EQUIPMENT IN JAPAN

The uncertainties of Japan's defense policy and changes in its defense market will affect both domestic producers and the marketing strategies of U.S. firms. Orders from the previous 5-year program should sustain business for most major Japanese defense contractors for several years. For example, commercial and defense orders for Ishikawajima-Harima Heavy Industries, Ltd. (IHI) engines contributed in fiscal 1989 to a 10-percent growth in engine order backlogs. Fuji Heavy Industries (FHI) and Kawaski Heavy Industries (KHI) have enjoyed brisk business due largely to their defense activities.

Maintenance and upgrade programs, such as those for the F-15J, are likely to keep many companies busy, especially electronics firms as they are tapped to provide new mission computers, radars, and software packages. If the F-4EJ-Kai upgrade is any indication, the electronic brains of the F-15Js will be reconstituted primarily with Japanese domestic components.[12]

Upgrade work is not sufficient to sustain other parts of the defense industries, however. JDA does not plan to pursue domestic development of a replacement aircraft for the indigenously produced T-2 trainer, manufactured by MHI and IHI.[13] Several companies involved in aircraft production, including MHI, could suffer if the FSX fighter does not move

[11] Japan Defense Agency, *Defense of Japan 1988* (Tokyo: Japan Times Co., Ltd., 1988), pp. 66-67, and *Defense of Japan 1989* (Tokyo: Japan Times Co., Ltd., 1989), pp. 77-78.

[12] One of the motivations for using Japanese parts in the F-4EJ Kai is to avoid disputes with the United States over technology flowback. Modifying existing F-4s would allow the U.S. Government to claim cost-free flowback under existing Memoranda of Understanding. Replacing U.S. components entirely with Japanese components sidesteps that issue, since no modifications are made.

[13] Michael Green, "Japan May Not Develop Trainers," *Defense* News, vol. 5, No. 17, Apr. 23, 1990, p. 1. The T-4 is a brandnew aircraft, however, that will operate for at least another 10 to 15 years. Replacement is not necessarily an urgent issue. There also is sufficient time for the government to change its inclinations on a successor aircraft. A new codevelopment program is not entirely out of the question.

into full-scale production. New programs mentioned above-including mid-air refueling tankers, over-the-horizon radar, MLRS and others-are on hold for at least a year.

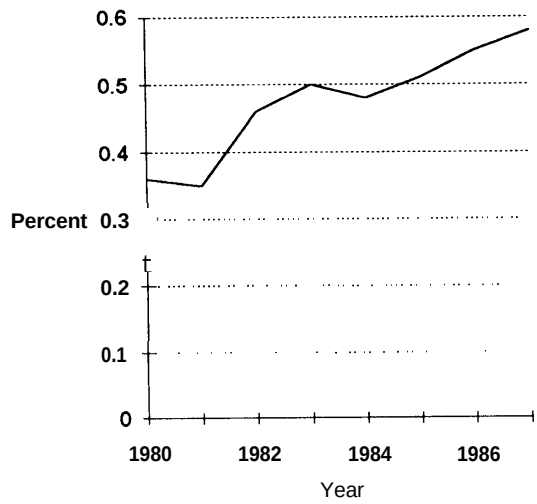
Although most Japanese firms do not depend heavily on defense sales, some firms have. Over the past decade, defense production has become somewhat more important in the Japanese economy (see figure 6-2). KHI stands out as an example, where orders from JDA have accounted for approximately 21 percent of KHI's total sales (see table 2-1 inch. 2). Reduced defense orders, then, could adversely affect its business, particularly in key areas such as aircraft production. The same is true, to varying degrees, for other companies such as MHI, FHI, and IHI.

The most important source of uncertainty over new business is that the government has decided against initiating new procurement programs of front line equipment in fiscal year 1991 (Apr. 1, 1991 through Mar. 31, 1992). Firms are concerned that a l-year hiatus in new programs could lead to additional delays, which complicates short-term planning and may lead companies to change their long-term strategies about the mix of commercial and military business.[14]

Some firms have already responded. MHI has announced plans to reemphasize defense sales in favor of commercial products, anticipating a decline in its defense sales from a high of 25 percent of total sales in recent years to 15 to 17 percent of total sales 2 to 3 years from now.[15] It also will shift much of its long-term defense focus to communications and R&D, positioning itself to take advantage of possible future orders. KHI, which was counting on JDA orders to provide as much as 70 percent of its total aerospace business by the year 2000, is also reevaluating its forecasts. IHI has joined General Electric Co.'s GE90 engine project in an effort to shift sales into commercial areas by committing 30 billion yen (slightly over $200 million at present exchange rates).

These changes may affect the mix of the top 20 Japanese defense contractors over the next 5 years, although MHI is likely to remain the market leader. The biggest potential change is Nissan's position,

Figure 6-2-Defense as a Percent of Total Industrial Production in Japan, 1980-87



SOURCE: Boei Nenkan (Tokyo: Boei Nenkan Publishing Co., various editions).

which has emphasized aerospace production and has placed high hopes on licensed production of the MLRS. If this program does go through, its estimated value of $650 million could elevate Nissan into the top 10 defense producers, and strengthen its position not only for future defense missile programs, but also for commercial ones as well.

Given the growing importance of electronics in Japanese defense procurements, MHI's sister firm and sometime competitor, Mitsubishi Electric Co. (MELCO), will also have a strong position. Other electronics firms are likely to benefit from the shift in procurement emphasis, including Hitachi, Ltd., NEC Corp., and Fujitsu, Ltd.

Three additional' factors may affect long-term planning for Japanese companies. International programs, such as Boeing's commercial transport production and the V-2500 engine, will influence the long-term marketing plans of Japanese firms, especially if defense orders decline. Second, since aerospace is a high government priority, Japan's domestic space program, still relatively small, will assume greater significance in terms of business opportunities to individual firms if defense orders fall. Finally, JDA will increasingly emphasize automated systems in light of the twin constraints of

[14]There are indications that procurement of major systems may be reduced by as much as $750 million over the neXt 5 years.

[15]"Gunyo Yori mo, Minsei ni Juten" ("Emphasis on Commercial Products Instead of Defense [D]*eland"), Asahi Shimbun*, June 21, 1990, Tokyo morning edition, p. 1.

personnel shortages and budgetary pressures. For example, MHI is planning to focus greater efforts on robotics and automated systems both in production and as final systems.[16] Potential applications for the latter range from observation vehicles and target drones to pilotless fighter aircraft.

It is not entirely clear how other firms will react to the changes in markets. Some companies, especially those affected by the discontinuation of F-15 and P-3C production, plan retraining programs to shift workers and engineers into other fields. One such example was the plan of a heavy industry company to transfer aircraft production engineers into software projects after 90-day training programs. In general, massive layoffs are not expected in Japanese defense companies, due to the lifetime employment commitment among larger fins: Japan's aircraft industry, which depends on military orders for 70 to 80 percent of its entire business, has maintained steady employment levels for the past several decades.

Regardless of the adjustments that companies in Japan are likely to make in the coming years, however, future procurement budgets will have an important impact on the relative mix of defense business and commercial production, and the status of defense contractors within the Japanese business community.

THE MARKET FOR U.S. EQUIPMENT AND TECHNOLOGY IN JAPAN

Reduced defense budgets in the United States, in Europe, and elsewhere have increased pressure on major contractors to look abroad for new sales. Some observers believe that more moderate procurement increases in Japan may result in greater political pressure to buy cheaper foreign systems off the shelf from overseas sources, especially if the yen remains strong against the dollar. Government and industry are committed, however, to maintaining the maximum feasible level of indigenous production and development. Therefore, it is likely that tighter markets at home and Japan's emphasis on local production will force foreign firms to make Japanese firms more generous technology licensing offers in order to sell in Japan.

However, because Japan's defense market is in a state of flux, the outlook for foreign companies is uncertain over the long term. Many programs that have served as market drivers for several years—F-15, P-3C, etc.—will terminate, and with the exception of the FSX, there are no new military aircraft programs on the horizon. Although the United States and Japan have a gentleman's agreement on FSX production, there is no guarantee that the aircraft will get beyond the prototype production stage. If it does, General Dynamics would reap most of the 40 percent U.S. production work share. That leaves few opportunities for other U.S. firms to deal with Japanese firms. A few development programs are under way, but in some cases (engine development programs, for example) they are directed specifically to reduce Japanese industry's reliance on American sources and in others, such as the medium-range surface-to-air missile project, the Japanese objective is to field a replacement to an existing American product.

Because ongoing procurement, maintenance, logistics, and other support items are likely to be emphasized to maintain the present framework of Japan's Self-Defense Forces, there will be few, if any major contracts available to U.S. producers of front line equipment. Markets will be strong in the electronics areas as Japan upgrades existing aircraft and institutes service life extension programs. But U.S. companies will face serious competition from domestic firms in the electronics areas. These contracts are likely to go to Japanese firms unless foreign companies are willing to consider generous licensing or codevelopment arrangements.

JDA has accepted the higher costs of local production in order to work with Japanese firms instead of foreign ones and to enhance the nation's defense industrial base. It is unlikely that this posture will change as a result of global political shifts or tighter budgets. Autonomy is a high priority for the government, and autonomy ultimately means limited opportunities for foreign companies.

THE ARMS EXPORT ISSUE

One concern that continues to attract attention in the United States is the possibility that Japanese firms might export weapon systems despite long-standing government policies to the contrary. U.S.

[16] Nobuyuki Oishi, "DefenseFirms Responding to Cold War's End," *Japan Economic Journal,* Aug. 4, 1990, pp. 1, 15.

defense contractors have transferred enormous amounts of defense technology to Japan, in part because they believed that Japanese f-would not compete with them in international markets. In the past, the Japanese business community has exerted pressure on government to liberalize arms export policies. This has led to concern among U.S. defense firms that a set of political and/or economic circumstances could combine to break down the policies that currently restrict Japanese defense exports. Some U.S. defense contractors argue that significant exports of dual-use components by Japanese firms indicate that Japan's arms export policies are outdated. They believe that Japanese firms have used the dual-use loop hole to enjoy significant defense business while adhering to the letter of government restrictions on exports of complete weapon systems.

Japan has articulated policies that restrict dual-use exports, but pressure within the business community has risen at times to challenge these policies. Business has argued that by establishing economies of scale through exports, the cost of JDA's procurements would decline and profits would improve. Exports could be used to strengthen ties with friendly nations, which would help to establish greater independence in Japan's foreign policy. Despite these arguments, however, the only signifi cant liberalization of Japan's arms export policies occurred in 1983 when the government agreed to promote exchanges of defense technology with the United States. And even here, amount of Japanese defense technology that has flowed back to the United States under the 1983 agreement has been negligible.

Japan's export potential in defense is ultimately tied to the strength of its domestic market. The paradox is that domestic production must remain constant or expand moderately in order to limit the allure of overseas markets. However, continued strong funding enhances the competitiveness of the domestic industry vis-a-vis global players, thus making it more likely that Japanese firms could in fact compete if they so desired.[17]

For the present, export policies remain intact. While corporate economic interests lie with exports, firms are extremely sensitive to the negative image of arms exports. MITI guidance documents to businesses on export control policies warn repeatedly of the public relations dangers of arms exports, noting that failure to take public opinion into account in these areas will jeopardize commercial sales. The same documents also warn against alienating the public to minimize political pressures in the Diet (against both business and the bureaucracy) .18

Japan has demonstrated economically and politically that it is willing to support a costly yet modest defense industry that does not depend on exports for survival. JDA and industry are willing and capable of developing and producing high-quality components and complete systems in many areas. Industry has made incremental improvements in its defense production that may eventually reduce the cost of indigenous development and production. The classic pattern of moving from import substitution to export capability is evident in Japanese defense production, but political decisions have restrained industry's movement into the export market (in distinct contrast with its support of industry's advances into international commercial markets). With continued political conviction, Japan's leadership should be able to maintain this policy for the foreseeable future.

Japanese firms are not entirely excluded from foreign defense markets. Vigorous trade in dual-use technologies often enables them to skirt the ban at the component level. Japanese firms can sell dual-use defense components and parts on a company-to-company basis, largely circumventing government policies on arms exports. It is difficult to assess these issues in depth because the degree of Japanese military exports is unclear. In the area of aircraft sales, it has been estimated that only $14 million in

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[17]See Keith B. Richburg, "Many Asians Fear Potential Military Threat From Japan," *The Washington Post*, Aug. 4, 1990, p. A18; Charles Smith, "Security Blanket," *Far Eastern Economic Review*, July 5, 1990, p. 11. For a Japanese perspective on these issues, see "Kozo Kyogi Izure Nichibei Anpo ni Fumikomu" ("Structural Talks Inevitably Impact U.S.-Japan *Security*"), *Ekonomisuto*, Apr. 24, 1990, pp. 44-51.

[18]Japan Ministry of International Trade and Industry, "Factors Affecting Availability of Japanese Dual-Use Technology to U.S. Defense Applications," undated planning document. MITI lists five areas influencing the availability of dual-use technologies to the United States: 1) corporate policies and the individual world views of companies, 2) export administration regulations, 3) media attention and public opinion, 4) data and patent rights, 5) corporate receptiveness: in light of: "consumer environment, you cannot survive a day if you don't have the media on your side, or without popular support." It adds that "the bureaucracy cannot survive. . . if it makes the Diet its open enemy." The Liberal Democratic Party, it concludes, cannot "defend either [the cabinet or the bureaucracy] if and when public sentiments erupt over defense issues."

defense-related exports originate in Japan annually.[19] This probably understates the extent of Japanese exports to the United States for defense purposes. Virtually all semiconductor and other electronics exports from Japan to U.S. defense contractors are recorded as commercial sales, for example, and U.S. dependence on Japanese technology and products is a longstanding issue in the United States.[20]

JAPANESE SELF-SUFFICIENCY IN DEFENSE

JDA programs and procurement over the last 20 years have illustrated a continued drive toward autonomy in defense production and, more recently, in R&D. Although it is doubtful that total self-sufficiency can be achieved in the near future, production trends show a push toward autonomy. Fully 90 percent of Japan's defense equipment is manufactured by domestic producers. But much of the equipment now counted as domestic is U. S.-origin defense systems produced under license in Japan, so the country actually depends more on U.S. industry than might appear. Nevertheless, import substitution programs have been under way since the beginning of the post-World War II period, and have accelerated since the United States ended its military aid programs to Japan.[21]

A slowdown in defense markets might actually enhance indigenous production of weapons in Japan. First, shrinking markets imply greater competition, which might in turn increase pressure on U.S. firms to license technology to Japanese companies in order to remain active in the market.[22]

The decline in superpower tensions could result in reduced emphasis on the development of more exotic technologies and systems such as those anticipated in the Strategic Defense Initiative, and greater emphasis on conventional systems in which Japan could probably develop sufficient capabilities.

Research and Development

Having moved in a significant degree toward autonomy in production, Japanese business is lobbying for higher defense R&D spending to develop new systems. Despite the prospect of defense budget reductions, for example, Keidanren[23] continues to press for a doubling of the budget of the Technical Research and Development Institute (TRDI), JDA's research and development arm, to an amount equal to 5 percent of JDA's current total budget.

There are factors in the nature of TRDI's R&D management and programs that both favor and impede this goal.[24] TRDI has requested a budget for fiscal year 1991 of 115.8 billion yen ($772 million), an increase of 12.5 percent over 1990 but still only about 2.5 percent of the total defense budget. (This is the budget for research, development, testing, and evaluation (RDT&E) and compares to over $40 billion for the U.S. defense budget.) TRDI's budget, however, should be viewed in the light of a national R&D expenditure, government and private of 10.6 trillion yen ($70.7 billion) in fiscal year 1988.[25]

TRDI's strategy is to stretch its relatively modest resources by cultivating promising technologies already under development in the private sector. In this way, TRDI has been able to move rapidly and dramatically in some specific areas, such as the FSX and the active phased-array radar. But this strategy is carried out at the cost of remaining dependent on U.S. defense technologies in other areas. Nevertheless, TRDI programs benefit significantly from extensive Japanese investment in commercial R&D (in fiscal year 1988 it was 7.2 trillion yen or $48.1 billion, almost equivalent to the U.S. commercial R&D investment on an absolute dollar basis), much of which is in dual-use technologies. Financial

[19] Michael Green, "Japan Looking to Europe To Fulfill Military Needs," *Defense* News, vol.5, No. 25, June 18, 1990, p. 1.

[20] U.S. Department of Defense, Office of the Under Secretary of Defense for Acquisition, "Report of the Defense Science Board Task Force on Semiconductor Dependency," February 1987.

[21] See U.S. Congress, Office of Technology Assessment, op. cit., footnote 3, pp. 66-67; *Boei Nenkan 1990 (Defense Annual 1990)* (Tokyo: Boei Nenkan Publishing Co., 1990), p. 488.

[22] European firms have made modest gains in Japanese defense markets and could provide a greater challenge to U.S. firms in the future.

[23] Keidanren, the Federation of Economic Organizations, is Japan's largest business organization.

[24] OTA examined Japanese defense research strategies in both U.S. Congress, Office of Technology Assessment, *Holding the Edge: Maintaining the Defense Technology Base*, OTA-ISC-420 (Washington, DC: U.S. Government Printing Office, April 1989), ch. 6; and U.S. Congress, Office of Technology Assessment, *Arming Our Allies*, op. cit., footnote 3, ch. 4 and app. C.

[25] Jon Choy, "1990 Update on Japanese Research and Development" *JEI Report*, No. 37A, Sept. 28, 1990, p. 10.

support can be provided selectively to advanced commercial technologies, enabling private firms to adapt the technology as necessary for defense purposes.[26] As Japan's commercial R&D base grows, SO does TRDI's.

This strategy limits Japan's ability to develop world class weapon systems in particular areas, but currently Japan does not aim for the best and latest in all areas, as does the United States. Achieving self-sufficiency and effective spin-on and spin-off of technology between commercial and military sectors does not require state-of-the-art technology in all areas.[27]

This is particularly evident in the defense electronics area. In the case of MELCO's development of the FSX active phased-array radar, JDA did not pay for the development of the underlying gallium arsenide chip technology or the production process development, which lowered unit costs to a feasible level. However, TRDI has supported radar technology at MELCO at a modest level since 1973, and this steady support for the military application, leveraged by the commercial R&D for the underlying technologies, has proved to be a winning strategy.

Future Collaboration in Defense Technology With Japan

Japanese defense firms will likely take one of two courses during an extended period of tight defense budgets. First, firms may seek international partners to assure their long-term survival in commercial business. This has been seen already on a dramatic scale with the MHI/Daimler-Benz cooperative agreement and to a lesser extent by IHI's steps to develop a cooperative relationship with General Electric. These types of arrangements could lead to global rationalization and more extensive technology transfers in key industries such as aircraft production.

The other possible course would be to shut out potential foreign competitors to preserve dwindling market shares at home. This is most likely in areas such as electronic components, where Japanese capabilities are generally very high, and less likely in areas such as aircraft production and systems integration, where Japan's industry size and capabilities remain limited. A decision by Japanese companies to restrict market access of (and cooperation with) U.S. defense companies would heighten trade-related frictions even in the face of reduced military budgets in both countries and diminishing East-West tensions.

Japanese firms would like to maximize local content in their defense products and at the same time maintain access to foreign technology and material. Defense contractors in Japan, like those in other advanced countries, seek a strong domestic industrial and technology base, a high degree of autonomy, and self-sufficiency.

Japanese Attitudes on Collaboration

Despite the difficulties associated with the FSX program, JDA supports continued collaborative development efforts with U.S. defense fins. Both industry and the military feel Japan needs continued access to U.S. defense technology because it does not have the budget or knowledge to push technology broadly on all fronts. JDA does not think that Japanese defense technology or industry pose a competitive threat to U.S. defense companies, and it does not see itself turning abruptly toward the European Community, despite aggressive efforts by EC member nations to sell weapons to Japan. (Some analysts argue that JDA's recent acquisitions of European aircraft for the Maritime Self Defense Forces suggest the opposite.) Japanese officials believe that the scale of FSX was too large to try as an initial codevelopment effort, but that the United States and Japan will learn together as they proceed.

Japanese industry is generally more interested in selling complete subsystems or components than it is in sharing its technology by licensing or coproduction. Industry simply does not perceive any benefit in licensing its technology to the United States without comparable gains. In commercial areas, these gains most often have been in the form of access to distribution networks or a percentage of an existing market. In the case of straightforward defense sales, such exchanges would quickly become politically sensitive.

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[26] Companies can recoup some of their military-oriented R&D expenses from JDA, either as a charge against future defense contracts for production, or by an administrative overhead charge similar to the U.S. Industrial Research & Development arrangement.

[27] Japan's technology imports in Japanese fiscal year (JFY) 1988 totaled 366.8 billion yen ($2.45 billion), compared to 293.7 billion yen ($1.97 billion) in exports. See Choy, op. cit., footnote 25, p. 20.

In addition to corporate outlook on technology exchanges, business-government interactions tend to restrict the access of outside firms to developing technologies in Japan, unless those firms develop extensive networks over along period of time. TRDI monitors commercial and dual-use technology through routine contacts with company officials and lab specialists. Because TRDI technical staff are essentially lifelong employees, there is little or no opportunity to move between government and industry. This helps to assure the free flow of information from industry to the government because the possibility of compromising proprietary information is minimized. In this respect, TRDI acts as an honest broker among Japanese firms and the application of their technologies to JDA's needs.

These mechanisms facilitate communication and coordination among these interests and help promote cross-industrial transfers. Meetings between ministry officials and business representatives also provide insights into government R&D initiatives years in advance, assisting companies with their long-term marketing and product development strategies. Considerable overlap takes place between JDA-industry and MITI-industry activities, further assuring extensive integration of JDA with the civilian industrial and technology base.

Possibility of Another FSX

More than any other issue, the possibility of another FSX case arising in the future has shaped U.S. perceptions and questions about defense cooperation with Japan. The notion of planning for another FSX has very opposite meanings, depending on the audience. For Japanese audiences, another FSX implies entering into additional codevelopment arrangements with the United States that might precipitate pressures from Congress across a much broader range of trade, technology, and economic issues. For the United States, it means a potential loss of technology and competitiveness in a critical industry through an ostensibly cooperative program.

It is reasonable to ask if another FSX will in fact make sense for either country in light of the current security outlook and the difficulty of making this program work to the satisfaction of all. FSX has not turned out to be what its Japanese and U.S. proponents expected. Japanese industry underestimated the dimensions of the tasks involved in developing an entire aircraft, even one based on an existing airframe. Resources have been stretched thin in the private sector by the project, to the point where both government and industry are concerned that it will interfere with the ability of companies to devote sufficient attention to civilian projects, such as MHI's Boeing subcontracting work. U.S. Government officials remain uncertain about the benefits of potential flowback of Japanese technology to American industry, and as a result are still ambivalent about participating in the program. The total development costs were substantially underestimated, and making up the difference will be difficult if downward pressures on the defense budget persist.

The prospect of another FSX is also limited because of reduced demand in Japan for new front-line weapons systems beyond those already in various stages of development or delivery. If peace breaks out in Asia as it apparently has in Europe, it is questionable whether there will be sufficient public or government support for the spending increases required to carry out major new weapons programs.

U.S. critics of the FSX project claim that the United States has not received adequate access to Japanese technology in return for what is being transferred to Japan. Others respond that U.S. Government and industry have not been sufficiently active in identifying opportunities to exercise the reverse technology transfer path. There have been three defense-related U.S. Government technology assessment missions to Japan, but to date there have been no technology transfers resulting from them.[28] Japan has proposed five areas for cooperation, and the two governments have begun defining arrangements governing projects in at least three of the five. At this pace, however, the United States cannot expect that any more than a trickle of projects will

[28]Defense Department teams have examined electro-optics and millimeter wave technology and manufacturing processes. The results of their assessments were published in U.S. Department of Defense, Office of the Under Secretary of Defense (Acquisition) for Research and Advanced Technology, "Electro-optics and Millimeter Wave Technology in Japan," May 1987; and Dr. Clinton W. Kelly et al., "Findings of the U.S. Department of Defense Technology Assessment Team on Japanese Manufacturing Teehnology," June 1989. In addition, a delegation from the U.S. Army Materiel coremand assessed Japanese technologies in U.S. Army Materiel Coremand "Assessment of Research and Development Opportunities in Defense-Related Technologies," U.S. Army Materiel Command, September 1989.

result in transfers of Japanese technology to the United States.

One of the primary problems **facing** U.S. firms **that** would like **to** collaborate in defense **technology with** Japanese companies is the difficulty in assessing the current state **of** Japanese technology. Despite steps made to rectify this situation, the United States remains insufficiently informed on the state-of-the-art in Japan. Furthermore, assessments often conflict. For example, in the case of the MELCO phased array radar, teams from the General Accounting Office (GAO) and the U.S. Air Force (USAF) reached strikingly dissimilar conclusions regarding Japanese capabilities. GAO found that Japanese production facilities were of "soldering iron vintage. ' '[29] GAO also concluded that the United States is well ahead of Japan in the critical areas promoted as benefits to the United States for participating in the FSX project, including wing composites and the phased array radar. In examining many of the same facilities, technologies, and issues, the USAF team concluded in contrast that 'Japanese facilities areas modern and well-equipped as anything to be found in the United States. MELCO'S modular technology to be used in the FSX radar is not far behind that of the U. S.' '[30]

Although there is support in some Japanese business and government circles for accelerating the pace of reciprocal technology transfer, there are a number of specific obstacles to transferring defense technology from Japan to the United States. On the Japanese side, there is 1) a narrow interpretation of the 1983 accord with respect to transfers to the United States, 2) a restrictive policy on third-country resales, and 3) a question of the definition of the term "dual-use" (see box 6-A). Each of these barriers is outlined below.

There is an elaborate process in Japan for the approval of technology transfer to the United States, depending on whether the item if for a purely commercial, dual-use, or military application. If a product is purely commercial, it can be sold under the normal commercial export licensing system. In theory, nonmilitary technologies need not be approved for export by the Joint Military Technology

Box 6-A—Japanese Military and Dual-Use Technologies

The Japanese Government defines "arms" as any of the following items (as stipulated in the Export Trade Control Order of Japan and the Policy Guideline of the Government of Japan on Arms Export of Feb. 27, 1976):

1. Firearms and cartridges to be therefor (including those to be used for emitting light or smoke), as well as parts and accessories thereof (excluding rifle-scopes).
2. Ammunition(excluding cartridges), and equipment for its dropping or launching, as well as parts and accessories thereof.
3. Explosives (excluding ammunition) and jet fuel (limited to that the whole caloric value of which is 13,000 calories or more per gram).
4. Explosive stabilizers.
5. Military vehicles and parts thereof.
6. Military vessels and the hulls thereof, as well as parts thereof.
7. Military aircraft, as well as parts and accessories thereof.
8. Antisubmarine nets and antitorpedo nets as well as buoyant electric cable for sweeping magnetic mines.
9. Military searchlights and control equipment thereof.
10. Bacterial, chemical, and radioactive agents for military use, as well as equipment for dissemination, protection, detection, or identification thereof.

According to the 1983 notes, "The term 'military technologies' means such technologies as are exclusively concerned with the design, production and use of 'arms' " as defined in the Policy Guideline of the Government of Japan on Arms Export of Feb. 27, 1976 and the Export Trade Control Order of Japan. "Arms" by definition "are to be used by military forces and directly employed in combat. The Policy Guideline states further that equipment related to arms production will be treated in the same manner as arms.

Any other technologies by implication are considered commercial or defense-related (but other than military).

[29]U.S. *Congress,* General Accounting *Office, U.S.-Japan Codevelopment: Review of the FS-X Program,* NSIAD-90-77BR (Gaithersburg, MD: U.S. General Accounting Office, February 1990), p. 29.

[30]Unclassified executive summary of USAF trip report, May 1990, p. 5.

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Commission (JMTC).[31] In practice, however, military technologies have been defined by the Japanese Government, and by MITI in particular, by their end use, not necessarily by their origin or potential for applications in commercial or military products.

If a product is considered to be dual-use, the Japanese seller is required to obtain a significant amount of information from the buyer regarding the end-use of the item. This includes a certification by the end user that the item will not be used as a weapon or as part of a weapon. This process is said to take 1 to 3 months. If the item is scheduled for a military application, there is additional scrutiny by MITI and the JMTC. In the past there have been several cases where dual-use technology transfers were denied by MITI because they specifically were headed for a military contract. This situation is particularly applicable to electronic components and subsystems, and has the effect of discouraging export applications, both by Japanese and U.S. firms. MITI claims to be trying to reverse this impression, but there have been few test cases to date.

A final concern is that U.S. defense systems often are shared with other allies, and Japanese regulations forbid third-country transfers. Furthermore, many Japanese advanced defense concepts have commercial components included in them that are not owned by JDA. Consequently, Japanese companies that own the technology may require a royalty or other payment in return for their commercially developed technology. A suggestion has been made in Japan that JDA should buy the technology from industry so that they are in abetter position to negotiate with the United States, although the mechanics of this type of arrangement could be costly and cumbersome.

[31] The U.So-Japan Joint Military Technology Commission (JMTC) was established by the November 1983 notes on technology transfers to facilitate actual exchanges. It consists of representatives from Ministry of International Trade and Industry, the Japan Defense Agency, Ministry of Foreign Affairs, and senior representatives from the U.S. Embassy in Tokyo. For additional details on the mechanics of transferring technologies utilizing the JMTC, see U.S. Department of Defense, Office of the Under Secretary of Defense for Research and Engineering, "Japanese Military Technology: Procedures for Transfers to the United States," February 1986.