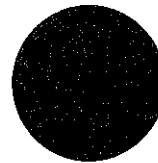
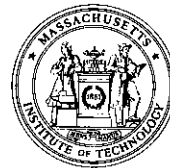


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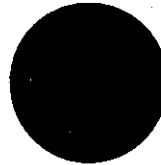
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**U.S.-JAPAN DEFENSE TECHNOLOGY COOPERATION:
TEN GUIDELINES TO MAKE IT WORK**

**Michael J. Green and Richard J. Samuels
MITJP 94-07**

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and its Working Paper Series

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U.S.-JAPAN DEFENSE TECHNOLOGY COOPERATION: TEN GUIDELINES TO MAKE IT WORK

Michael J. Green and Richard J. Samuels
The MIT-Japan Program
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INTRODUCTION

Defense industrial cooperation has been an important theme in the U.S.-Japan alliance for over four decades, but the transfer of defense-related technology has been almost entirely one way from the United States to Japan. For many years there were clear strategic advantages in this arrangement for the U.S. government, and clear financial advantages for participating U.S. firms. There were also clear technological reasons for the imbalance. But, increasingly, the lack of reciprocity in defense-related technology transfer threatens to undermine the sense of common purpose that forms the basis for the alliance relationship. The two governments have been attempting to redress this imbalance since the late 1970's through the Systems & Technology Forum (established in 1980), the 1983 joint military technology transfer agreement, the 1989 memorandum of understanding on FSX, and most recently through the Pentagon's "Technology-for-Technology" initiative (TFT--also known as the "Perry Initiative").

The TFT initiative has only just begun, and it would be difficult to argue that any of the earlier forums, agreements and initiatives established a lasting pattern for

reciprocal defense technology transfer. The reasons are numerous and simple: for one thing, U.S. industry has not identified much Japanese military or dual-use technology that it wishes to adopt for military application. Second, when it has done so, the channels for such transfer have been sclerotic. Third, negotiations have been left to the U.S. and Japanese governments, which have had to respond to political pressure and have therefore arrived at politically expedient solutions. No one seems to have developed an answer for the more fundamental question, however: what would a realistic framework for **substantive** defense technology reciprocity look like?

The MIT-Japan Program began examining this question in a meeting held in Cambridge on June 18, 1992 for Japan experts, defense analysts and technology managers from government, academia and industry. A consensus emerged from that meeting that future attempts to expand bilateral defense technology collaboration would have to overcome the huge gap in communication and understanding that exists between the potential users of non-derived Japanese dual-use technology in the U.S. (the military services, labs and defense contractors) and the providers of that technology in Japan (hi- tech companies).

In the summer and fall of 1993, the MIT-Japan Program conducted three detailed surveys: one for Japanese industry; one for U.S. industry; and one for the directors of international programs in the U.S. Departments of Defense and Energy.¹

¹ See Green, Michael. "The Japanese Defense Industry's Views of U.S.-Japan Defense Collaboration: Findings of the MIT Japan Program Survey," MIT-Japan Program Working Paper WP94-01, January 1994 and Matthew Rubiner, "U.S. Industry and Government Views on Defense Technology Cooperation with Japan: Findings of the MIT-Japan Program Survey," MIT-Japan Program Working Paper WP94-03, March 1994.

Then in March 1994, MIT and the Defense Production Committee of Keidanren (the Federation of Economic Organizations--Japan's largest business organization) held a joint workshop at the Massachusetts Institute of Technology for experts from U.S. and Japanese industry to discuss the policy implications of the surveys' findings. Over two days, the participants offered frank opinions and explanations regarding the objectives of bilateral defense technology collaboration, the obstacles to expanded collaboration, and possible new approaches to the problem. Given the political firestorms that have emerged with this issue in the past, there was a remarkable degree of unanimity on why reciprocal technology collaboration is important to both countries and on what would and would not work.

This report draws heavily on the surveys and the discussions held in Cambridge, **but it is not meant to be a joint statement on behalf of the participants in the MIT- Japan Program study.** Instead, it is the authors' own interpretation of what lessons policymakers and industry officials in both the U.S. and Japan could draw from the exercise at MIT.

One issue on which all the participants in the MIT meeting agreed was that the U.S.-Japan defense and technology relationship has changed, and is likely to change further. Military programs in both nations are more dependent than ever on commercial know-how. Moreover, some U.S. programs need Japanese collaborators, and Japanese producers are concerned with the commercial implications of technology transfer to the United States. In a post-Cold War setting, a comprehensive and balanced defense and technology relationship between the U.S. and Japan should run

the gamut from government-sponsored joint development of military subsystems, to inter-industry cooperation on developing commercial markets for dual-use technologies. There are specific steps both governments could take to bring clarity and consistency to the rules of technology transfer (especially in the defense arena), and for national security reasons both governments will continue to restrict the release of certain sensitive technologies. But the guiding principle must be *flexibility*. Efforts on the U.S. side to push a project or scheme that is not workable will backfire across the entire defense and technology relationship doing damage to areas where there is already healthy cooperation. Unwillingness on the Japanese side to consider new approaches could be equally damaging.

The following guidelines are offered with the recognition that managing the U.S.-Japan defense industrial relationship is an extremely complicated task for government and industry in both countries, and that its effective management is more important than ever for both nations.

TEN GUIDELINES

- 1. Defense technology collaboration should reinforce, not undermine the alliance.**

In the past, initiatives for bilateral defense technology collaboration have been advanced by supporters of the U.S.-Japan Security Treaty as evidence of alliance solidarity and burden-sharing, even though actual substantive technology transfer to the United States has been minimal. As a result, expectations were created that remain unfulfilled. Today, advocates of reciprocity in technology transfer are no longer exclusively motivated by a concern to sustain the alliance. They include those who question the very *raison d'être* of the alliance itself. And they point to the imbalance of technology transfer as evidence of the fundamental pathologies in the relationship.

Like our survey respondents in both Japan and the United States, we believe that achieving reciprocity in technology now ought to be central to the strategies of alliance managers. But, we also believe that there is a danger that in compensating for past practices of subordinating technology issues to the political-military purposes of the alliance, the DoD might stray too far from the original alliance context of defense technology collaboration. The DoD ought not overcompensate for past failures. Goals of commercial competitiveness are (and should be) central; we believe that they can be achieved through a comprehensive strategic dialogue with Japan that addresses security and technology equally.

The MIT-Japan Program survey suggests that Japanese industry is extremely skeptical about U.S. motives in the technology-for-technology initiative.² It must be made clear that the DoD will not deprive Japan of the weapons it needs for its own

² Green, *op.cit.*, p.21.

defense. Sales of desired systems must continue to be encouraged. Export restrictions should continue to be eliminated. It is also important to recognize that placing conditionality on continued Japanese licensing of U.S. systems will make the long sought indigenous alternatives to the U.S. system more attractive to Japanese industry and government.³ In some instances, it will be desirable to provide incentives for Japanese and U.S. producers to continue their relationships. In others, Japanese autonomy will better serve U.S. interests than continued unilateral technology transfer. The DoD needs to be flexible in evaluating which conditions obtain when.

2. Joint development of military subsystems can still be important.

Joint research and development of subsystems such as ducted rocket engines, eye-safe lasers, and phased array radar has led to negligible technology transfer to the U.S. side. The same is true for the much larger co-development of the FS-X fighter. It is not clear that joint development of either subsystems or integrated systems will ever lead to anything even approximating the kind of technological windfalls for U.S. industry that Japan gained by license-producing weapons systems from the U.S. Nevertheless,

³ For historical examinations of the debates in Japan over technological autonomy, see Richard J. Samuels, "Rich Nation, Strong Army": National Security and the Technological Transformation of Japan. Ithaca, NY: Cornell University Press, 1994 and Michael J. Green, Japan's Search for Autonomous Defense Production: Technonationalism and Alliance Politics in the Post-war Era unpublished Ph.D. dissertation, School of Advanced International Studies, The Johns Hopkins University, 1993.

the multiplier effect of joint projects should not be underestimated. The MIT-Japan Program survey demonstrated that Japanese defense industries are interested in joint research projects at the subsystems level. This should be pursued to the extent that such projects educate U.S. engineers about the technological strengths of their colleagues in Japan, lead to partnerships that help U.S. companies integrate themselves into Japan's R&D structure and improve military interoperability.

Again, however, joint development projects will require a comprehensive security dialogue with Japan that situates projects in the broader context of the alliance and national technology interests.

3. The Japanese Government must clarify the three arms export principles.

In the MIT-Japan Program survey, U.S. and Japanese industry identified the Japanese government's Three Arms Export Principles as a major (in the Japanese survey **the major**) obstacle to greater defense technology collaboration. The U.S. has no interest in pushing the Japanese Government to end the ban and begin exporting arms. However, the implementation of the ban at the working level seems far more restrictive than is required de jure. Further, these restrictions seem contrary to the spirit of previous bilateral agreements. In 1983 the U.S. and Japan agreed on an exception to the ban in which **military** technology could be transferred to the U.S. side by the Japanese Government, and transfer of **dual-use** technology would not be

blocked. There are numerous indications from the MIT-Japan Program survey and the workshop that the transfer of dual-use technology is being blocked, however. The ambiguity of the ban and the 1983 exception has led MITI officials to take an overly cautious and conservative view of its implementation, particularly given the sensitivity of defense issues in Japan. Clarification is required.

4. The technology we should want is manufacturing process technology--but it is the most difficult to transfer.

The MIT-Japan Program survey results suggest that U.S. industry has little or no interest in Japanese defense-related technology per se.⁴ However, there is clear evidence that U.S. industry does have a strong interest in Japan's ability to manufacture critical subcomponents with high yield, high quality, and at low cost. Manufacturing process technology is not something that can be easily transferred. It depends upon management philosophy, industrial structure, and market focus. The challenge for U.S. policy is to create opportunities for U.S. companies and DoD labs to learn from the experience of commercially-oriented Japanese companies in these areas. Joint projects, if properly constructed, could yield that kind of experience. In addition, the USG may want to encourage Japanese producers of critical components to establish production in the United States in partnerships with U.S. industry. Incentives for such partnerships might include procurement opportunities with the U.S.

⁴ Rubiner, op. cit., p.12.

Government and prospects for other offsets (recognizing, of course, that clarification of Japan's three arms export principles would first be required.

5. Japan Could Play A Positive Role in U.S. Efforts at Defense Conversion

While Japan's three arms export principles continues to seem to unnecessarily limit the potential interaction of DoD contractors with Japanese companies for defense purposes, there is more immediate potential for partnerships that assist U.S. companies with defense conversion. Current USG policies for defense conversion such as the Technology Reinvestment Projects (TRP) have begun to stimulate new R&D philosophies in U.S. defense firms, but have not helped these firms to gain access to the venture capital, manufacturing process technology, and new **international** markets that firms need to survive in a commercially competitive environment.⁵ These are precisely the areas where Japanese companies may have something to offer. It is up to the DoD to structure Japanese participation in ways that enhance the U.S. industrial technology base.

⁵ See for example, Eric Pages, "Next Steps in Business Conversion: Supporting Innovation and Entrepreneurship." BEN (Business Executives for National Security) Report, November 1993.

With declining defense demand, U.S. companies will be under great financial pressure to license defense technology to foreign companies, including Japanese companies. U.S. policy should make this unattractive unless there is a technological benefit to U.S. firms as well. Where Japanese companies are interested in U.S. defense technology (Toyota's aerospace subsidiary The Ishida Group, for example, has displayed a strong interest in the commercial applications of Bell/Textron's tilt rotor technology) the USG can and should insist on partnerships in which Japanese companies provide not only capital but **also** marketing strategies (especially in Asia) and manufacturing process technology to the U.S. side. For this reason, it makes sense to consider Japanese participation in TRP with all of the conditions just described.

Another example of how technology-for-technology initiative based on defense conversion could benefit U.S. companies is the Ishikawajima-Harima-Industries/Newport News partnership. While the substance of the deal is not yet clear, the **potential** advantages to Newport News are. IHI has survived in the highly competitive world of commercial shipbuilding --a feat which Newport News may soon have to attempt given the declining U.S. Navy demand for aircraft carriers.

6. Whenever possible, industry-to-industry initiatives must be fostered.

Government must set the parameters within which defense and dual use technology are transferred or joint development projects are undertaken. However, critical dual-use technology in Japan is primarily the property of private firms, and for that reason government policies must aim at promoting industry-to-industry collaboration as much as possible.

The MIT-Japan Program survey suggested that within the ranks of Japanese industry, there are two broad views of defense technology collaboration. On the one side, there are heavy industries (represented by companies such as Mitsubishi Heavy Industries or Kawasaki Heavy Industries) that have a long history of dealing with the U.S. on defense industrial issues and are heavily dependent on government contracts for markets and technology development. Such companies do not fear the "defense" label and are comfortable working with the Japanese Government. On the other side are those hi-tech consumer electronics companies (such as Sharp or Kyocera) that have little defense business and rely much more on the consumer market. These companies are not dependent in any way on MITI or the JDA --in fact, heavy involvement from these ministries could be a deterrent to cooperation with U.S. firms. However, these are precisely the types of companies that own the critical dual-use technologies that the U.S. has identified as important.

Ultimately, U.S. policy must contain commercial incentives for these consumer-oriented, hi-tech firms if we expect access to their critical technologies. We cannot expect either the coercive ability of the Japanese government or the attraction of access to U.S. military technology alone to yield results.

7. Industry in both countries must be a fuller partner in developing policies for technology collaboration.

In the past, reciprocal defense technology schemes have failed for lack of industry interest on both sides of the Pacific. This is not surprising given the growth in procurement budgets in both the U.S. and Japan in the 1980's. Now industry must adjust to a different environment --one in which they will face more pressure to enter into international programs and a greater need to expand collaboration in non-defense areas. The MIT-Japan Program survey results and workshop discussions indicated that U.S. and Japanese companies still have a strong preference for the traditional modus operandi of one-way licensed production, with little concern for the consequences of technology flows.⁶ Industry must recognize that there is a higher national interest in achieving technology reciprocity that goes beyond individual corporate concerns for market share and profit. On the other hand, DoD must recognize that successful technology collaboration with Japan will have to be based on commercial incentives, and this requires a greater sensitivity to industry concerns.

⁶ 38 % of Japanese companies responded that continued license production is the best form of defense technology collaboration (36% said joint development of subsystems and 6% said tech transfer to the U.S.). Meanwhile, 53% of U.S. firms indicated that their goal in defense technology collaboration was simply to expand market share in Japan, while no U.S. company expressed an interest in acquiring Japanese technology. See Rubiner, p. 18 and Green p. 15.

8. DoD must have better coordination between FMS and technology offices.

The MIT-Japan Program survey of U.S. and Japanese industry also identified the DoD's policies on foreign military sales as a major obstacle to greater defense technology collaboration.⁷ There is no need to open the spigot on U.S. defense technology, but if DoD has an interest in achieving substantive and sustained access to (rather than merely the more limited the flowback of) Japanese dual-use technology, there must be greater coordination across the Defense Department and with other agencies, such as the Department of Commerce. For example, the offices responsible for foreign military sales must be provided with incentives that are consistent with those that define the goals of offices responsible for new systems development. And both must be nested under the more comprehensive strategy articulated above.

In addition, the MIT-Japan Program survey and workshop indicated that there is concern in both Japanese industry and government about the transfer of Japanese dual-use technology to third countries. From the Japanese perspective, DoD has not provided adequate guarantees against third country transfer. USG officials may view export controls as something imposed on Japan by the U.S. and therefore not a serious obstacle to bilateral collaboration, but there clearly are internal Japanese pressures to control the export of sensitive technology and the U.S. side must take these into account.

⁷ 96% of Japanese industry and 83% of U.S. industry responded that a more flexible policy on FMS would improve bilateral defense technology collaboration. See Green, p.24 and Rubiner p. 23..

9. The USG must increase its ability to monitor the impact of closer defense technology collaboration with Japan.

If successful, the technology-for-technology initiative will lead to unprecedented levels of mutual access in the U.S.-Japan technology relationship. The MIT-Japan Program survey suggests that the U.S. Government does not have the ability to assess developments in Japanese dual-use technology, let alone monitor the impact of U.S. defense technology on Japan's own competitive strategies.⁸ To achieve reciprocity in technology, each side must understand the value of that technology to the other side. For example, our survey and meeting suggested that Japanese firms are interested in the new DoD Continuous Lifetime Acquisition Supply (CALs) system, as a way to upgrade the aging just-in-time system.⁹ Japanese corporate participation in this system should be encouraged, but should also be predicated upon our appreciation of the ways it is linked to corporate strategic goals in Japan.

⁸ Only 34% of USG offices responded that they have staff regularly monitoring technology developments in Japan. 84% of U.S. industry respondents reported that they have staff monitoring Japanese technology developments, but primarily through license production arrangements with Japanese partners. See Rubiner, p. 8.

⁹ JIT --or "lean production"-- was at the heart of the Japanese auto industry's success story in the 1970's and 80's, but the system is proving antiquated and desperately in need of new software to manage the increasingly complex inventory problems companies are facing. See Michael Cusumano, "Japanese Technology Management: Innovations, Transfer Ability and the Limitations of 'Lean Production'". MIT Japan Program Working Paper MITJP 9-92.

10. There are opportunity costs associated both with increased U.S. technological independence and with expanded technology collaboration with allies like Japan..

The scale of defense R&D and procurement will probably continue to decline in the U.S. while the vast defense/dual use technology base will be increasingly difficult to sustain independently. At the same time, the DoD will have less of a need for massive supplies of components. Technology is diffusing across borders at an increasing rate and nations simply cannot control all niche specialties. Maintaining the defense industrial base in this environment thus becomes a vitally important issue in our over alliance relations with countries like Japan.

To the extent that the U.S. seeks greater autonomy in critical dual-use technology areas, the costs will increase in terms of budgetary resources, efficiency and relations with allies (particularly when DoD supports closed indigenous development of commercially important technologies). On the other hand, if certain critical technologies are not supported by defense demand in the U.S. (or even DoD subsidies), then there will be greater pressure on U.S. companies to provide offsets when marketing related systems or subsystems abroad. DoD policy must find a middle ground between encouraging the off-sets that decimate the domestic supplier base and the costs that are incurred by isolating low volume, high performance producers within an exclusively military economy.

Identifying that middle ground depends on DoD's ability to consider the ways in which the defense industrial base is only as innovative as its general industrial base,

especially the second and nth tier. Current plans for acquisition reform indicate that thinking is moving in the right direction. But acquisition reform that leads to greater integration of the U.S. commercial and defense technology base will eventually lead to greater integration of the U.S. and **Japanese** dual-use industrial bases. Both governments need to begin building the framework that guarantees that this new comprehensive technology relationship serves our mutual security requirements and brings benefits to companies on both sides.