
Transformation of Japan's Defence Industry? Assessing the Impact of the Revolution in Military Affairs

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Unlike its counterparts in the United States and Europe, Japan's post Second World War defence industry is isolated from global defence trade, has limited dependence on defence revenue and relies heavily on licensed production of American platforms and systems. These characteristics could change through participation with US companies in joint development of a ballistic missile defence system (the main focus of Japan's version of the Revolution in Military Affairs) and, more speculatively, through Japanese procurement of the next generation of fighter aircraft. But the extent of any such change is difficult to predict at this stage.

As an economic superpower, Japan generates commensurately sophisticated technology and is a prolific supplier of high-tech products to the global market place. But this is only the case for civilian technology. Japanese weapon manufacturers have almost no presence in the global arms market. This clear contrast between civilian technology and military technology is a consequence of the Japanese government's prohibition of arms exports.

Japan's defence industry was thoroughly destroyed during the Second World War (WWII). For a period after WWII, Japan exported ammunition and small arms. However, since the late 1960s, the Government of Japan (GOJ) has maintained a uniquely stringent prohibition on arms exports. Denied access to export markets, Japan's defence industry had to rely on Japan's small domestic market for survival and no 'made-in-Japan' military aircraft or other weapons are available outside Japan.

As a consequence, Japan's defence industry has been characterised by isolationism, less dependency on defence revenue and *kokusanka* (indigenous production) orientation with dependence on the US defence industry.¹ However, the Revolution in Military Affairs (RMA) has the potential to catalyse the transformation of Japan's defence industry. Since the late 1990s, Japan's Self Defence Force (SDF) has transformed in three dimensions: organisation, alliance, and equipment.² Of these, the most

¹ About *kokusanka*, see Michael J. Green, *Arming Japan: Defense Production, Alliance Politics, and Postwar Search for Autonomy* (New York: Columbia University Press, 1995).

² National Institute for Defense Studies, *East Asia Strategic Review 2007* (Tokyo: National Institute for Defense Studies, 2007), pp. 228-247.

significant is organisational change. Transformation of equipment is only a part of overall SDF transformation. However, ballistic missile defence is a key element of Japan's defence-oriented RMA which is also driving to the transformation of Japan's defence industry. In order to cooperate with the United States on missile defence, the GOJ has relaxed previous restraint on technology transfer from Japan. This decision does not mean that the GOJ is lifting all restraints on arms export. But the decision demonstrates that the current structural constraints on Japan's defence industry are not immutable. Similar signs of change can be detected in the current debate on next generation fighter (F-X). In addition to the US-manufactured F-22A or F-35, the Eurofighter Typhoon is considered to be viable option.³ If Eurofighter Typhoon wins the competition, this would be the first instance of Japan importing a major platform from Europe and such a procurement would widen Japan's defence industry connections to Europe.

In addition, at the political level, discussion began on direct defence off-set which has been never done by GOJ contract.

One can find other symptoms of transformation in the Japanese defence industry. If such transformation happens, it can be attributed largely, but not wholly, to the RMA. Hence this article analyses the significance of the RMA as a catalyst for transformation of Japan's defence industry. The article begins by examining the characteristics of Japan's defence industry and associated structural factors to identify which part of Japan's defence industry shows symptoms of changes. The article then analyses the form of Japanese RMA with particular reference to missile defence. The article concludes with a discussion of the current and likely future impact on the SDF of transformation of equipment. In short, RMA could combine with other variables such as strategic environment or economic situation to catalyse the end of Japanese defence industry's isolation from trends in the world defence industry and transform the current industry.

Characteristics of Japan's Defence Industry

STRUCTURAL FACTORS

Japan has enjoyed economic great power status since late last century. Underpinning this position is Japanese industry's technological prowess which has made names like Sony, Honda, Toyota or Panasonic household names globally. However, such technological prowess is confined to civilian markets. In the world of defence industry, Lockheed-Martin, Boeing or British Aerospace are the major players and Japanese companies, such as Mitsubishi Heavy Industry or Kawasaki Heavy Industry, are little known and play virtually no role in the international arms market. Normally the level of technological sophistication achieved by countries like Japan confers strong

³ National Institute for Defense Studies, *East Asia Strategic Review of 2008* (Tokyo: National Institute for Defense Studies, 2008), pp. 196-199.

competitive advantage in both international civilian markets and defence market. In the case of Japan, however, there is no such correlation. Japanese defence industry is unique in this respect.

This asymmetry can be attributed to a single structural constraint: prohibition of arms exports. This unique policy was adopted as a symbol of a 'peace-oriented country' and now is well known among defence specialists. However, this prohibition is not a product of the current 'peace' constitution. By the end of WWII, the infrastructure of Japanese defence industry had been devastated by American strategic bombing. It revived when the Korean War broke out and United States and other United Nations (UN) Command forces asked Japanese industry to supply maintenance materials. At that time, arms exports were not prohibited. Japan's first arms export after WWII was the sales of 37 mm shells to Thailand in 1953.⁴ Subsequently, Burma, Taiwan, Brazil, South Vietnam, Indonesia and the United States became customers of Japan's defence industry.⁵ At that time, Japanese industry exported no advanced weapon systems and overseas sales were confined to small arms or ammunitions.⁶ But, in contrast to the present situation which results from Japan's self-restraint, Japanese defence industry did not export advanced weapons immediately post WWII simply because at that time the industry could not develop them. However, leftist politicians became concerned that Japan's expanding arms exports could prejudice the nation's reputation as a 'peace loving country' acting in accord with its 'peace' constitution. In response to pressure from the leftist opposition Japan Socialist Party, the GOJ led by the Prime Minister Eisaku Sato promulgated the "Three Principles of Arms Export" in 1967.⁷

The "Three Principles of Arms Export" did not completely ban the export of weapons but did prohibit weapons sales to communist countries, countries under arms embargo pursuant to a UN resolution and countries engaged in armed conflict. Therefore, under the Three Principles, arms exports to the United States or North Atlantic Treaty Organisation (NATO) countries are not banned. However, following the Prime Minister's enunciation of the Principles, the GOJ strengthened the restraints in response to further demands from the Japan Socialist Party. In 1972, the Minister of Ministry of International Trade and Industry, Kakuei Tanaka, stated that Japan should extend arms export restraint to include countries in addition to those already

⁴ Sakuragawa Akiyoshi, 'Nihon no Buki Kinyu Seisaku: Buki Yushutu Sangensoku no Kokkairongi wo Megutte' (Japan's Policy on Prohibiting Arms Export: Diet Debate on Three Principles of Non-Arms Export), *Kokusai Seiji*, vol. 108 (March 1995), pp. 84-100.

⁵ Ibid., p. 84.

⁶ Ibid., p. 84.

⁷ In the diet, the member of the opposition party said "Japan should prohibit arms export to foreign countries to maintain the spirit of the Constitution of Japan that emphasizes the importance of peace seeking policy", *Dai Gojugo Kai Kokkai Shugiin Kessan linkaigiroku Dai Gogou* (Transcript of the Committee of Account of the House of Representatives), vol. 5 (21 April 1967), p. 10

banned by the Principles.⁸ Finally, after some diet debates, GOJ issued a further statement of arms export policy on 27 February 1976.⁹ That statement expanded the scope of arms export prohibition beyond three categories stipulated in the Three Principles to include *all* arms exports.

Japanese defence industry, precluded from export markets since the middle of the 1970s and confined to a very limited domestic market (defence expenditure is capped at less than one percent of Gross National Product) is denied economies of scale. This structural constraint accounts for some of Japanese defence industry's unique characteristics.

CHARACTERISTICS OF JAPANESE DEFENCE INDUSTRY

Of the three characteristics of Japanese defence industry mentioned earlier (isolationism, little dependency on defence revenue, and *kokusanka*) the first two characteristics are the result of structural constraint on arms export.

Isolationism is the direct consequence of GOJ's restriction on arms export. This strict prohibition on arms export not only precludes participation by Japanese defence industry in the international arms sales market. With the recent exception of missile defence research and development with the United States (see below), the arms export prohibition policy also precludes military technology transfers. Hence, Japanese defence industry cannot participate in international development program such as the Joint Strike Fighter. Consequently, Japanese defence industry has been isolated from the globalisation of Western defence industry.

Table 1: World and Japanese Defence Manufacturers

| World Rank | Company | Country | Defence Revenue (US\$million) | Total revenue (US\$million) | Percentage of Def. Revenue |
|------------|-------------------|---------|-------------------------------|-----------------------------|----------------------------|
| 1 | Lockheed Martin | US | 36 090 | 39 620 | 91.0% |
| 2 | Boeing | US | 30 800 | 61 530 | 50.0% |
| 3 | BAE Systems | UK | 25 070 | 26 967 | 93.0% |
| 4 | Northrop Grumman | US | 23 649 | 30 148 | 78.4% |
| 5 | Raytheon | US | 19 500 | 20 291 | 96.1% |
| 25 | Mitsubishi HI | JPN | 2 354 | 26 024 | 9.0% |
| 47 | Kawasaki HI | JPN | 1 107 | 12 201 | 9.1% |
| 50 | Mitsubishi EI. | JPN | 998 | 30 568 | 3.3% |
| 59 | NEC | JPN | 705 | 39 460 | 1.8% |
| 89 | IHI Marine United | JPN | 378 | 848.1 | 44.2% |

Source: 'Defense News Top 10', *Defense News*, (6 July 2007).

⁸ *Dai Rokujuhachi Kai Kokkai Shugiin Yosan linkai Daiyon Bunkakai Kaigiroku* (Transcript of the Fourth Sub-Committee of Committee of Budget of the House of Representatives) (23 March 1972), p. 24.

⁹ Statement of Prime Minister Miki Takeo, 'Buki Yushutsu ni Kansuru Seifu Touitsu Kenkai', 27 February 1976.

The marginal significance of defence revenue to Japanese defence industry reinforces the industry's isolation. Table 1 shows the top five world defence manufacturers and Japanese defence manufacturers.

As this table shows, Mitsubishi Heavy Industry, although the largest defence corporation in Japan, ranked only twenty-fifth in the world defence industry based on defence-related revenue in 2006. The second largest defence firm in Japan, Kawasaki Heavy Industries, ranked forty-seventh and the third largest, Mitsubishi Electric, ranked fiftieth. Particularly significant for present purposes is the last column indicating defence revenue as a percentage of total revenue. Compared to other big defence firms, defence related revenue accounts for a very limited share of the total revenue of Japanese defence corporations. Mitsubishi Heavy Industry's defence related revenue was 9.0 percent of total revenue. Kawasaki Heavy Industry's was 9.1 percent and Mitsubishi Electric's was 3.3 percent. In contrast, for Lockheed Martin, the world's largest defence contractor, defence related revenue accounted for 91.0 percent. Boeing is a big manufacturer of civilian aircraft which explains why its dependence on defence related revenue (50.0 percent) is relatively small when compared to that of Lockheed-Martin (91 percent) or the third largest defence company, BAE systems (93.0 percent). But even Boeing's defence related revenue was much larger than that of Japanese defence firms, except IHI Marine United.

This small percentage of defence revenue in Japanese defence firms compared to other countries' major defence firms suggests that the structure of the Japanese defence industry is completely different from its foreign counterparts. While Japanese defence companies are minor player in world defence industry, in terms of total revenue, they are not insignificant. For example, Mitsubishi Heavy Industry's total revenue is bigger than Raytheon, which has the fifth largest defence revenue in the world, and is almost the same as that of BAE systems. Similarly NEC, which ranks fifty-ninth in defence revenue terms, earned almost the same amount as Lockheed-Martin, the world's largest defence firm. Defence business is the mainstay of the world's typical major defence firms. In Japanese defence firms, on the contrary, civilian revenue supports their defence business.

Again, this characteristic of Japanese defence industry is a consequence of its lack of access to international arms markets. The limited SDF market denies the possibility for Japanese defence industry to enjoy economies of scale and undermines the viability of defence-specialised firms and requires the defence sector to be supported by civilian sector.

Another difference between Japanese defence industry and international defence industry, particularly Western defence companies is the lack of consolidation. This lack of significant consolidation can be attributed to Japanese defence firms' lesser dependency on defence revenue. Since defence revenue alone cannot sustain Japanese firms and support from

civilian sector is indispensable, a defence-led consolidation is hardly likely. In other words, unlike their Western counterparts, Japanese defence firms (more precisely, the defence element of Japanese manufacturing) can survive without consolidation between defence firms. Put another way, in Japan, consolidation is not the solution to defence firms' quest for survival. The conspicuous exception that proves the rule is IHI Marine United, which is a consolidated ship builder. This company's dependence on defence revenue (44.2 percent) is exceptional in Japan and is a result of its origins as a consolidated ship builder.

Japanese defence industry's lesser dependency on defence revenue confers one comparative advantage. Since few companies specialise in defence business and most do both defence and civilian business, their defence elements can make the best use of 'dual-use' technology.

The third characteristic of Japanese defence industry is *kokusanka* (indigenous production) combined with the introduction of key technology from the United States. Historically Japanese defence industry succeeded in developing world-class weapon systems such as the Zero Fighter. But, after the industry's devastation during WWII and the subsequent prohibition from military research and development during the occupation period from 1945 to 1951, the technological level of Japanese defence industry lagged far behind that of the US defence industry. Following the resumption of military related production and research and development, Japanese defence policy makers and defence industry sought to foster Japan's technological potential by undertaking licensed production of American weapon systems in preference to off-the-shelf imports.¹⁰ Initially, Japanese defence industry took advantage of Japan's status as a US ally, to introduce key technology from the United States. For its part, the United States wished to take advantage of Japan's regional preponderance in heavy industry and fostering the Japanese defence industry served to advance the American Cold War strategy in Asia. This congruence of US and Japanese national interests combined with the United States' forthcoming attitude to encourage Japanese defence industry in pursuing *kokusanka* (indigenous production) of modern weapon system.¹¹

But once Japanese defence industry acquired the capability to develop modern weapon systems, such one-way technology transfer to Japan became problematic for the US side. However, the GOJ's strict restraint of arms exports precluded trans-pacific technology exchange. Thus, defence industrial cooperation has become a serious US-Japan alliance management issue since the 1980s. The most serious dispute occurred over development of the FS-X fighter aircraft. (The Japanese Defence

¹⁰ Michael J. Green, *Arming Japan: Defense Production, Alliance Politics, and the Postwar Search for Autonomy* (New York: Columbia University Press, 1995), pp. 7-30.

¹¹ *Ibid.*, pp. 53-71.

Agency designates fighter-attacker as 'fighter-support', so that the next generation of such aircraft is designated 'FS-X'.) The Japan Defense Agency (JDA) initially sought *kokusanka* and decided to develop an indigenous fighter aircraft with assistance from the American defence industry. However, the US Congress insisted on reciprocity of technological transfer and refused to allow Japan to pursue its original plan to introduce engine technology and flight computer program code and demanded that Japan buy US aircraft off-the-shelf.¹² Finally, this crisis in alliance management was settled by basing FS-X development on the US-made F-16.¹³

The FS-X saga demonstrated the emerging complexities of *kokusanka*, especially in terms of alliance management. But Japanese defence industry still sticks to *kokusanka* in such weapon systems as tanks, armoured personnel carriers, and some missiles.¹⁴ Even when the weapon system is imported from the United States, Japanese defence industry prefers licensed production rather than off-the-shelf-purchase through Foreign Military Sales (FMS). A recent case in point is the local production of AH-64D Apache Longbow.

RMA in Japan

With the end of the Cold War, most advanced countries faced the need to transform their militaries. Needless to say, the most visible example is the United States. In addition, however, the NATO countries, Russia and China have sought to reform the organisation, technology and doctrine of their respective militaries. The September 11 terrorist attack reinforced this trend. Japan is no exception.

The thrust of Japanese reform of the SDF is visible in the *National Defense Program Guidelines for FY 2005 and After* issued in 2004 (hereafter, NDPG 2004). This document spelled out a concept of Japan's defence capabilities for the post September 11 world. It indicates that the SDF now seeks to transform itself in three dimensions.

The first dimension is organisation. The NDPG 2004 emphasised a new concept of defence capability based on a "multifunctional, flexible, and effective force". To achieve these key objectives—multifunctionality, flexibility, and effectiveness—the Japanese government has enacted laws for coping with a national emergency and for responding rapidly to a ballistic missile attack. In addition to strengthening joint operation capabilities, the government in 2006 also legislated to give the JDA the status of a ministry and to redefine international cooperation activities as one of the primary missions of the SDF.

¹² *Ibid.*, pp. 86-107.

¹³ *Ibid.*, pp. 102-3.

¹⁴ *Ibid.*, p. 130.

The second dimension is equipment. In this context, Japan introduced a Ballistic Missile Defence (BMD) system. As the launch of ballistic missiles by North Korea in July 2006 shows, the ballistic missile threat is becoming more pronounced, making the introduction of BMD an urgent task. In addition, SDF equipment will be further transformed through the introduction of next generation of fighter aircraft, transportation aircraft and maritime patrol aircraft.

The third dimension is the alliance. The Defense Policy Review Initiative (DPRI) has transformed two aspects of the Japan-US alliance: the first aspect involves defence cooperation on roles, missions, and capabilities. The second aspect involves the realignment of US forces in Japan.

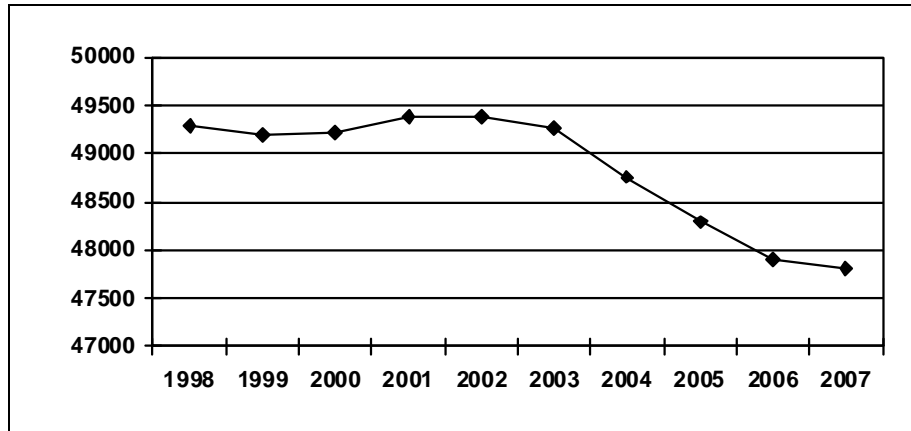
While the RMA is most prominent in the equipment dimension of SDF transformation, this is not the most important part of SDF transformation. The organisation dimension is more important to SDF transformation.

In defining Japan's defence posture, including the roles and missions of the SDF, NDPG 2004 is a watershed in the history of Japanese defence policy. The preceding document, *National Defense Program Outline for FY 1995 and After* ("outline" changed to "guidelines" in the 2004 version), prescribed an SDF defence posture based on "territorial defence first, and other functions second". Within this framework the document stipulated three roles for the SDF: defending territory; responding to various situations other than war (such as disaster relief); and contributing to a more stable international security environment through defence dialogue and security exchange. Under this mindset, all resources are allocated to improving territorial defence capability. Other missions, such as overseas peacekeeping operations, were undertaken by diverting assets from territorial defence capabilities. Obviously, territorial defence operations and international peacekeeping operations require fundamentally different capabilities. To accommodate the increasing demand for contributions to international operations, the SDF needed to change its pre-2004 mindset. Resolution of the mismatch between the SDF orthodoxy of territorial defence and the SDF reality of growing international commitments began with the 2004 revision of the NDPG. The most significant aspect of the 2004 revision is the change from a "territorial defence first" defence posture to a "Multi-Functional Flexible and Effective Defense Force" posture structured for "both territorial defense and international operations". Under this new defence posture introduced by NDPG 2004, the mission priority of SDF has changed and international operations are accorded higher priority than in the 1995 version.

But this transformation of Japan's defence posture must take place within the constraints of a flat budget. Japan's constrained fiscal circumstances mean that a precondition for the SDF's transformation to a "Multi-Functional Flexible and Effective Defense Force" is that it takes place within existing

defence budget allocations.¹⁵ Figure 1 shows recent trends in Japanese defence budgets.

Figure 1: Japanese defence budget from 1998 to 2007 (100 million Yen)



Source: Japan Defense Agency (after 2007, Ministry of Defense), Defense White Paper of each year.

As this graph shows, Japan's annual defence budgets have continued to shrink since 2002, regardless of the nation's external security situation. This downward trend of defence expenditure was maintained despite the launch of North Korea's ballistic missile Taepo Dong 1 and its flight over Japanese territory in 1998, the decision to initiate Japan-US joint technological research on missile defence in 1999 and Chinese nuclear-powered submarines' illegal submerged transit of Japanese territorial water in 2004. SDF transformation, then, is being pursued in the face of stringent fiscal constraints.

This has led the GOJ to emphasise organisational transformation of the SDF so as to make more effective use of resources. In pursuing such 'cheap' transformation, the GOJ has enacted the National Emergency Act, strengthened SDF joint operation capabilities by establishing the Joint Staff Office, upgraded the JDA to the Ministry of Defense, and designated international cooperation activities as one of the SDF's primary missions.

This is not to suggest that the SDF has given up on transformation through modernisation or/and innovation of equipment. The SDF seeks to upgrade its equipment having regard to strategic necessity, basic defence policy and

¹⁵ The NDPG 2004 stipulates "Mindful of increasingly severe fiscal conditions, we will restrict defense expenditures by further rationalizing and streamlining defense forces. We will also work to make our defense forces successful in carrying out their missions by harmonizing their operations with other measures taken by the Government". *National Defense Program Guidelines of FY 2005 and After* (10 December 2004).

resource constraints. Among these factors, Japan's basic defence policy is second only to financial constraints in shaping the transformation of SDF equipment. Under Japan's Exclusively Defense Oriented Policy (EDOP),¹⁶ the SDF force structure has been developed exclusively for the nation's territorial defence. EDOP not only constrains the SDF from participating in overseas operations, but also precludes the SDF from having the capability to strike another country's territory and confines it to a passive defence posture. The Diet cites the EDOP in prohibiting the SDF from acquiring 'exclusively' offensive capabilities, such as aircraft carriers like America's super carriers, long-range strategic bombers and ballistic missiles.

The EDOP's formal banning of 'exclusively offensive' capabilities is reinforced by the voluntary restraint exercised by Japanese leaders. The SDF's land attack capability provides a good example of such voluntary restraint. The Japan Air Self-Defense Force (JASDF) has limited land attack capability and has concentrated its resources on interceptors. Currently it has about 200 F-15s as interceptors and about fifty fighter-attackers, both indigenously developed F-1s and F-2s jointly developed with the United States. These fighter-attacker aircraft are unique in that land attack—including close air support—is not their primary mission. This fighter-attackers force was developed as an anti-ship force to interdict an invader's amphibious forces. The JASDF did not acquire land-attack precision guided munitions until 2005¹⁷ and now is going to operate aerial refuelling planes, which was permitted to do so by the Diet in 2001.¹⁸ Finally, the SDF has limited power projection capabilities and lacks aircraft carriers. The air wings of the Japan Maritime Self-Defense Force (JMSDF) consist of helicopters and P-3Cs and focus exclusively on Anti Submarine Warfare (ASW). Therefore, Japan cannot achieve air-superiority beyond the range of JASDF fighters.

¹⁶ Japanese defence policy is based on the article 9 of the Constitution: "Article 9: 1) Aspiring sincerely to an international peace based on justice and order, the Japanese people forever renounce war as a sovereign right of the nation and the threat or use of force as means of settling international disputes. 2) In order to accomplish the aim of the preceding paragraph, land, sea, and air forces, as well as other war potential, will never be maintained. The right of belligerency of the state will not be recognized." This part of the Constitution does not forbid having armed forces for defence of the country. The defence White Paper of Japan explains the view of Japanese Government. See *Defense of Japan* (Tokyo: Urban Connections, 1999), p. 53: "As long as Japan remains an independent nation, it is recognized beyond doubt that these provisions do not deny the inherent right of self-defense that Japan is entitled to maintain as a sovereign state. Since the right of self-defense is thus not denied, the Government interprets this to mean that the Constitution allows Japan to possess the minimum level of armed strength needed to support the exercise of that right. On the basis of this understanding, the Government has, as part of its exclusively self-defense-oriented basic policy on national defense under the terms of the Constitution, preserve the Self-Defense Forces (SDF) as an armed organization, continued to equip them and sought to prepare them for operational use."

¹⁷ Japan Defense Agency, *Heisei 16 nendo ban Nihon no Bouei: Bouei Hakusho* (Defense White Paper of 2006) (Tokyo: Japan Defense Agency, 2006).

¹⁸ The National Institute for Defense Studies, *East Asian Strategic Review 2001* (Tokyo: The National Institute for Defense Studies, 2001), pp. 308-11.

This defence posture means that transformation of the SDF along the lines of American-style stand-off precision strike would not suit Japan. Transformation of SDF equipment must be consistent with EDOP. Japan's current strategic environment is dominated by threats from North Korea's ballistic missile and by concern about China's growing ballistic missile forces. It would therefore be logical to put missile defence at the core of SDF equipment transformation. RMA hinges on network-centric-warfare which, in turn, is indispensable for missile defence. Hence Japanese RMA seems likely to be realised through deployment of missile defence and the resulting transformation of SDF equipment and organisation.

The Impact of SDF RMA and Japanese Defence Industry

CHANGES IN JAPANESE DEFENCE INDUSTRY

As already indicated, strategic developments in Asia are prompting transformation of SDF organisation, equipment, and alliance relationships. As a technological innovation, RMA is a sub-set of the SDF's equipment transformation. While Japanese security requirements place ballistic missile defence system at the core of Japan's RMA, the SDF's equipment transformation program also includes procurement of fighters, transportation aircraft, and maritime patrol aircraft.

The above programs of SDF equipment transformation are affecting Japanese defence industry. While changes in the characteristics of Japanese defence industry are gradual rather than dramatic, they are clearly discernable.

Missile defence development has a key role to play in changing Japanese defence industry's historical isolation. Japanese commitment to missile defence began in the 1980s as a result of participation in Western Pacific Missile Defense Architecture research for the Strategic Defense Initiative. This was not government-to-government cooperation but corporation-based cooperation. But this participation was a watershed of Japan-US cooperation in defence technology. Subsequently, Japanese defence industry showed strong interest in the US missile defence development program as it evolved through Global Protection Against Limited Strikes and to Theatre Missile Defence (TMD)/National Missile Defence (NMD) phases. At that time, the US interest in Japanese participation in missile defence development was focused on realising a two-way technology transfer rather than the previous one-way transfer. When Defense Secretary Les Aspen visited Japan in 1993, he indicated that the United States would not agree to licensed production and Japan's only options were either off-the-shelf purchase or joint development. In response, the GOJ sought to participate in the research and development phase of missile defence, beginning with

analysis of Japan's missile defence requirements. To this end the TMD Working Group was started in 1995.¹⁹

In 1998, after North Korea's Taepo-Dong long-range ballistic missile overflew Japanese territory, the GOJ decided to initiate joint technological research with the United States on sea-based upper-tier missile defence (Navy Theatre Wide Defence by AEGIS cruiser/destroyer), which paved the way to Japanese participation in American missile defence project.²⁰ This joint technological research focuses on four technologically challenging components of an AEGIS vessel-based upper-tier missile system: the nose cone, the infrared seeker, the kinetic warhead, and the second-stage rocket motor. In taking this decision, the GOJ signalled a three-stage approach to BMD, comprising research, development, and deployment. At the conclusion of each stage of the project, an exit decision must be made before proceeding to the next stage. Pursuit of research on a particular system will not automatically lead to development of the same system, and the system chosen for deployment may be different from what was researched and developed.

Subsequently, the GOJ upgraded its BMD efforts. In addition to the above joint technology research, in December 2003 Japan's cabinet and Security Council decided to deploy the already developed PAC-3 (a surface-to-air BMD system) and the Standard Missile (SM-3 Block I, a sea-based upper-tier missile defence system) systems to counter existing ballistic missile threats.

In the case of the joint AEGIS-based missile defence research project, the GOJ decided to proceed to development phase. In December 2005 the cabinet and the Security Council approved joint development with the United States of the SM-3 Block IIA, also known as the 21-inch diameter SM-3 interceptor.²¹ The latter appellation derives from the fact that the diameter of the missile is 21 inches up to the warhead, making it wider than the SM-3 Block IA currently in service with the SDF, which has a 13.5-inch diameter above the second-stage rocket motor.

Development plans for the SM-3 Block IIA include enhancement of such missile components as the 21-inch second- and third-stage rocket motors, the advanced infrared seeker, the advanced signal processor and the divert

¹⁹ About this process, see Kawakami Takashi and Jimbo Ken, 'Dando Misairu Bouei to Nichibei Doumei: Nichibei Kyoudou Kenkyu no Seisaku Katei to Kongo no Tenbo (Ballistic Missile Defense and the Japan-US Alliance: Policy-Making Process of Japan-US Joint Technological Research and Future Outlook', Morimoto Satoshi (ed.), *Misairu Bouei (Missile Defence)* (Tokyo: Japan Institute for International Affairs, 2001), pp. 263-5.

²⁰ Statement of the Chief Cabinet Secretary, 'Japan-US Joint Technological Research on Ballistic Missile Defense' (25 December 1998).

²¹ Statement of the Chief Cabinet Secretary, 'Japan-US Joint Development of Upgraded Interceptor for Ballistic Missile Defense' (24 December 2005).

and attitude control system, as well as upgrading of the AEGIS system and the vertical launch system. Japan's role in the project is centered on development of the nose cone, third-stage rocket motor, second-stage rocket and control system.

The GOJ's decision to participate in the above development is of major importance to Japanese defence industry. Whether or not the SM-3 block II project proceeds to deployment, joint development included technology transfer to the United States. The decision to permit such transfers says much about the GOJ's evolving attitude to arms exports.

In his Statement on NDPG 2004, the Chief Cabinet Secretary indicated that cooperation with the United States on missile defence is an exception to the GOJ's current restriction of arms export based on three non-arms export principles which remain in place.²² In this way, the GOJ is using missile defence cooperation with the United States to begin reducing the isolationism of Japanese defence industry. Even though Japanese defence industry is sub-contracting to American defence corporations and is not exporting integrated weapon systems, this activity is a potential watershed for Japanese defence industry. If the development of SM-3 block II proceeds to deployment, some parts of the interceptor will be manufactured in Japan and exported to the United States, thereby expanding Japanese defence industry's currently limited market and modifying that industry's isolationism.

Japan's F-X program has similar potential to transform Japanese defence industry. As stated, six fighter aircraft, F-22A, F-35, F-18E/F, F-15E, Eurofighter Typhoon and Rafael are the candidates for the F-X. A decision by the GOJ to select either the F-22A or Eurofighter Typhoon as F-X would imply a major departure from the GOJ's traditional fighter procurement policy.

The Obey Amendment prohibits the export of F-22A to foreign countries in order to protect the technology involved. Even if the US Administration could persuade the Congress to waive the Obey Amendment and permit Japan to buy the F-22A, there is no possibility of the United States permitting the GOJ to follow the traditional path of licensed production of the aircraft in Japan. In this event, the aircraft sector of Japanese defence industry would play no role in the JASDF's fighter procurement program regardless of their *kokusanka* orientation, and Japan's incentive to participate in Joint Strike Fighter-like multinational development program of next generation of fighter will be strengthened.

²² Statement of the Chief Cabinet Secretary, 'National Defense Program Guidelines for FY 2005 and After and Mid-Term Defense Build-Up Program for FY2005-2009' (10 December 2004).

If the GOJ chooses the Eurofighter Typhoon, licensed production would be an option. But this choice would constitute a major departure from the JASDF's traditional acquisition of US-developed intercept fighters: F-86F, F-104J, F-4EJ, and F-15J. Choice of Eurofighter Typhoon would be Japan's first major aircraft procurement program from Europe. It would diversify Japanese defence industry's links to international defence industry beyond the current American connections, with monumental consequences for the Japanese industry.

UNCHANGING PART OF JAPANESE DEFENCE INDUSTRY

On the other hand, some of the characteristics of Japanese defence industry will endure, particularly its *kokusanka* orientation. Even if the GOJ chooses the F-22A, the JASDF is also buying transportation aircraft and maritime patrol aircraft. In the case of transportation aircraft, the GOJ decided to develop an indigenous aircraft, the C-X, rather than purchasing C-130J or C-17 from the United States. The C-X is being developed as a joint venture by the Japanese air industry, with turbo-fan engines being acquired from General Electrics. In the case of maritime patrol aircraft, Japan also chose the indigenous development option rather than purchasing the P-8 being developed by the United States. This Japanese maritime patrol aircraft, designated P-1 (formerly P-X), will not use American engines but will use engines manufactured in Japan by Ishikawajima-harima Heavy Industry.²³

As these aircraft development programs show, Japanese defence industry's *kokusanka* orientation remains robust. In addition, since relaxation of current arms export policy is limited to missile defence programs, Japanese defence industry's limited dependency on defence revenue will not be affected. This will remain the case even if missile defence joint development and a possible future production program expand the market for the Japanese companies involved. Such expansion will be limited to missile defence and will not extend to other arms sales market which will remain closed for Japanese defence industry.

Nor is the GOJ's policy toward defence offsets likely to change. Licensed production by Japanese defence industry under *kokusanka* as arrangements constitutes a form of indirect defence offsets. But the GOJ has never sought direct defence offset.²⁴ Nor does this seem likely to change, despite some political suggestions that the GOJ introduce direct offsets to compensate for the cost of defence procurement.²⁵ This is because Japanese fiscal law and

²³ Ishikawa Junichi, 'Jieitai no Shin Kokusan Sentouki Koukuuki wo Miru' (Glancing SDF's New Fighter and Aircraft, *Gunji Kenkyu*, vol. 43, no. 2 (February 2008), pp. 50-4.

²⁴ In US Department of Commerce report on defence offsets, the United States does not have any direct offset contract with Japan. Bureau of Industry and Security, Department of Commerce, 'Offsets in Defense Trade, Tenth Study: Conducted Under Section 309 of the Defense Production Act of 1950, as Amended' (December 2005).

²⁵ The most active politician is Pak Shin-Kun of Democratic Party of Japan. See *Dai Hyakurokujuhachi Kokkai Sangiin Gaiko Bouei Iinkai Kaigiroku Dai Kyu Gou* (Transcript of the

account law prohibit such government contractual arrangements and to date there has been no attempt to amend these laws.²⁶

Conclusion

This article has argued that the GOJ's virtual ban on arms exports accounts for Japanese defence industry's long-standing isolationism, limited dependency on defence revenue and *kokusanka* orientation (drawing on key technology from American defence industry). The article suggests that ballistic missile defence will be at the core of Japan's version of the RMA. Japanese defence industry involvement in joint development of ballistic missile defence with the US could enable that industry to break out of its current isolationism. This RMA-based erosion of Japanese defence industry's isolationism could be reinforced if Japan chooses the F-22A or the Eurofighter Typhoon as the next generation fighter.

On the other hand, some Japanese defence industry characteristics will not change. Indigenous development of transportation aircraft (C-X) and maritime patrol aircraft (P-1) will underpin Japanese defence industry's continuing *kokusanka* orientation. Nor is the industry's limited dependence on defence revenue likely to change. The GOJ has made a significant exception to Japan's strict prohibition on arms exports in order to permit Japanese defence industry involvement in joint development of ballistic missile defence but this is unlikely to lead to comparable relaxation of other arms exports in the foreseeable future.

Overall, RMA is likely to change the characteristics of Japanese defence industry significantly but not sufficiently to constitute a fundamental transformation of that industry. However, if relaxation of the current structural restraints on Japanese defence industry continues, then Japanese defence industry's characteristic isolationism, minimal exposure to defence business and *kokusanka* will gradually adjust in response. At present, it is impossible to predict whether such a change will eventuate and, if it does, how far reaching it will be.

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Committee of Diplomacy and Defense of the House of Councilors of 168th Diet vol. 9) (4 December 2007), p. 13.

²⁶ Ibid., p. 5.