Chapter 2 Measures on Defense Equipment

Section 1 The Current Status of Defense Production and Technological Bases, and the Strategy on Defense Production and Technological Bases

1 The Current Status of Japan's Defense Production and Technological Bases

The term "defense production and technological bases" refers to the human, physical and technological bases for development, production, operation, sustainment and maintenance, remodeling, and refurbishment of defense equipment required for MOD and SDF activities. As Japan has no national arsenal (state-owned munitions factory), most of the technological base is covered by companies that manufacture defense equipment and associated items (the defense industry). Therefore, a broad range of companies in the defense industry[1], which are equipped with specialized and advanced skills and facilities are involved in the "defense production and technological bases."

On the other hand, the advances in recent defense equipment have raised per unit cost and maintenance/sustainment costs, which has caused a decrease in the number of units procured. In addition, despite the trend in increasing research and development costs, the ratio of research and development expenditure to defense-related expenditure has leveled off. Furthermore, Japan's defense production and technological bases also face challenges in retaining and passing on skills and techniques, and some companies, which cannot cope with the reduced number of units being procured, have pulled out of the defense business. There has also been exposure to changes in the international security environment such as the realignment of the European/US defense industries and advances in international joint development and production projects. Amidst these situations, there are new changes emerging

Fig. III-2-1-1 Current Status of the Unit Price and the Acquisition Quantity of Defense Equipment

Status of Procurement: Unit Price

Type-74 Tank: Approximately 0.39 billion yen (contracted in FY1989)

↓ (2.5 times increase)

Type-10 Tank: Approximately 1 billion yen (contracted in FY2014)

Harushio type: Approximately 38.6 billion yen (contracted in FY1991)

↓ (1.35 times increase)

Soryu type: Approximately 52.1 billion yen (contracted in FY2014)

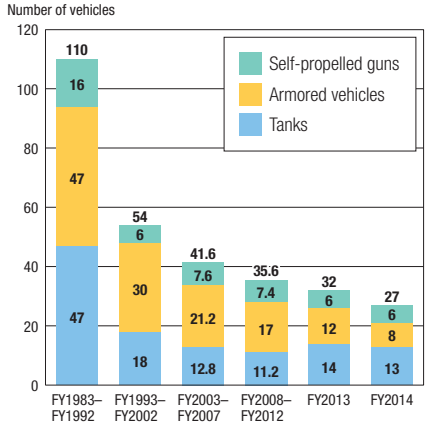
F-4EJ: Approximately 3.8 billion yen (contracted in FY1977)

↓ (4.2 times increase)

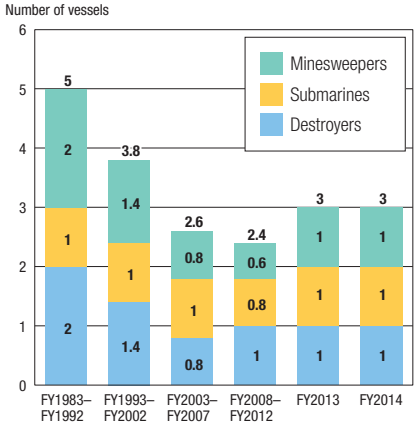
F-35A: Approximately 15.9 billion yen (contracted in FY2014)

Status of Procurement: Quantity

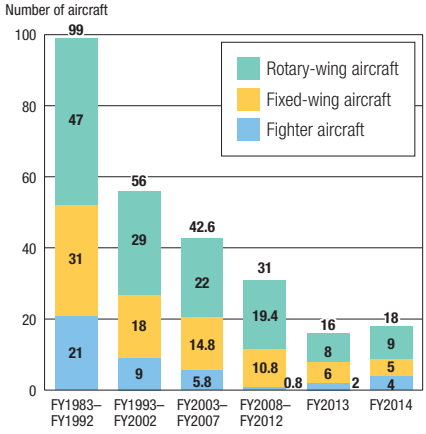
Trend in the annual average procurement quantity of the main vehicles (Data shown for the period prior to FY2012 is the annual average for each period)



Trend in the annual average procurement quantity of the main vessels (Data shown for the period prior to FY2012 is the annual average for each period)

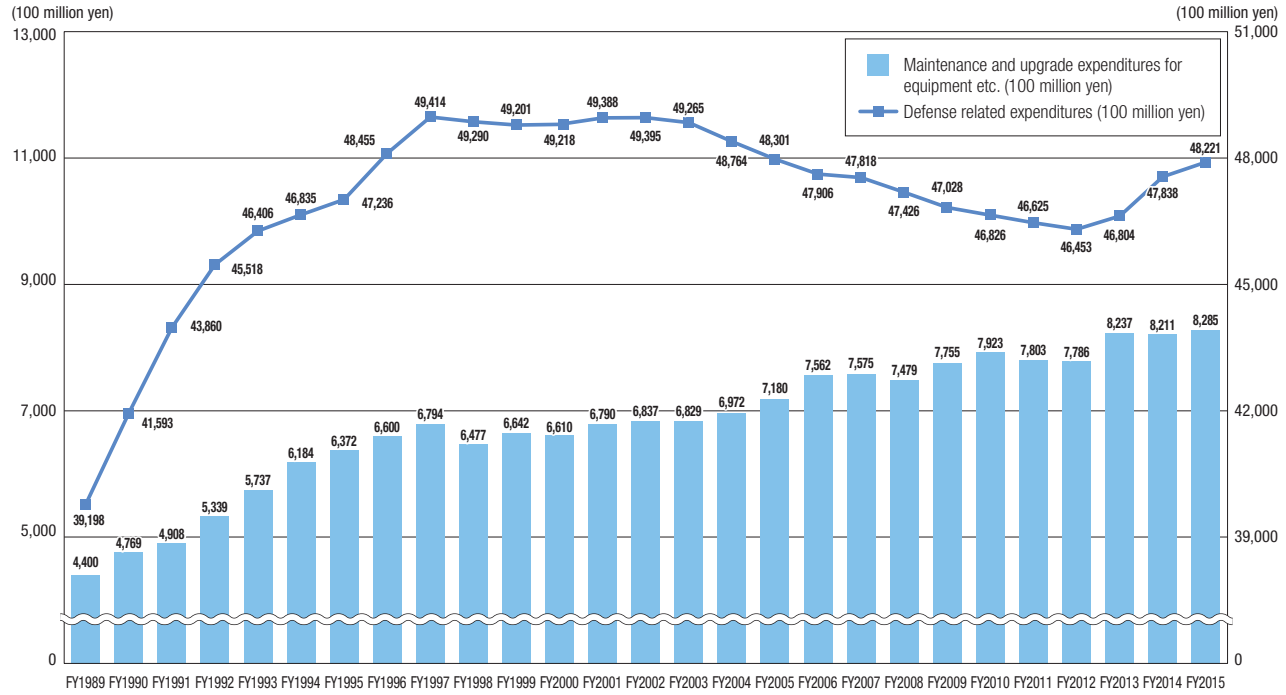


Trend in the annual average procurement quantity of the main aircraft (Data shown for the period prior to FY2012 is the annual average for each period)



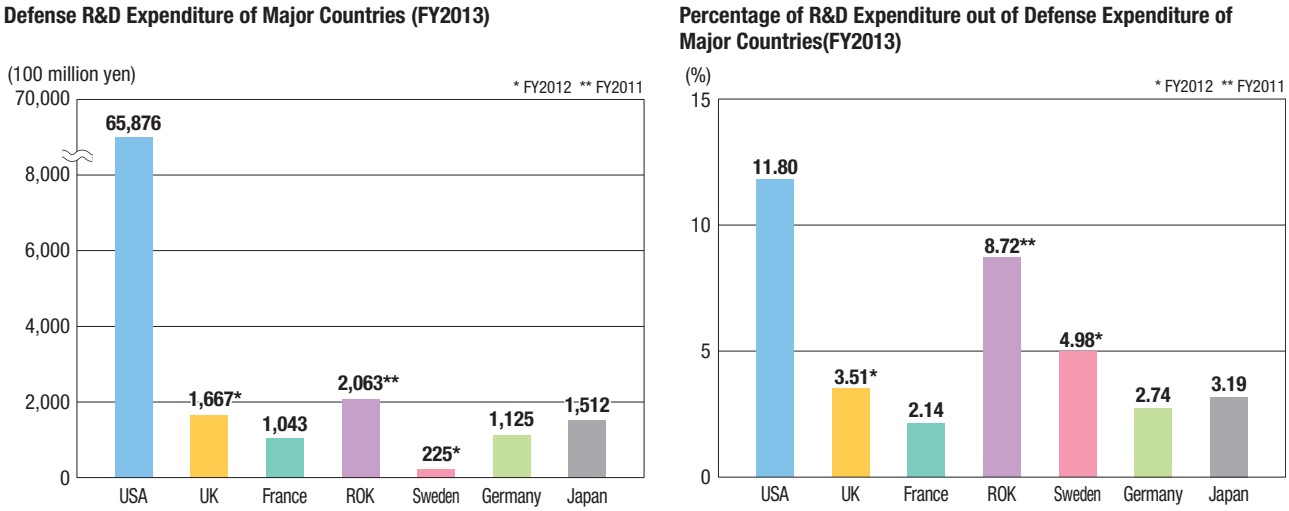
1 For example, it is said that there are approximately 1,100 fighter aircraft-related companies, approximately 1,300 tank-related companies, and approximately 8,300 destroyer–related companies.

Fig. III-2-1-2 Trends in the Maintenance and Upgrade Expenditures for Equipment, etc.



Note: "Maintenance and upgrade expenditure" refers to the budget for repair costs for equipment, consumable goods costs, and service costs (repair costs exclude those repair costs for the extension of vessel life and modernization of aircraft).

Fig. III-2-1-3 Current Status of Research & Development Expenditure



Source: "OECD:Main Science and Technology Indicators"
"THE MILITARY BALANCE 2014"

in the framework, such as the overseas transfer of defense equipment and technology based on the Three Principles on Transfer of Defense Equipment and Technology which was approved by the Cabinet in April 2014.

See Fig. III-2-1-1 (Current Status of the Unit Price and the Acquisition Quantity of Defense Equipment)

See Fig. III-2-1-2 (Trends in the Maintenance and Upgrade Expenditures for Equipment, etc.)
See Fig. III-2-1-3 (Current Status of Research & Development Expenditure)
See Part I, Chapter 2, Section 6-2 (Trends Concerning Defense Production and Technological Bases)
See Part II, Chapter 2, Section 4 (Three Principles on Transfer of Defense Equipment and Technology)

2 Defense Production and Technological Bases Strategy

1 Context of Formulation of Strategy on Defense Production and Technological Bases, etc.

In light of the current situation, for the purpose of maintaining and strengthening Japan's defense production and technological bases, which are important and essential elements supporting Japan's defense capability, the "Strategy on Defense Production and Technological Bases" was adopted in June 2014. The Strategy responded to the National Security Strategy and the National Defense

Program Guidelines (NDPG), replacing "kokusanka-hoshin (guideline for domestic development/production)."[2]

The Strategy identifies the targets for and significance of maintaining and strengthening defense production and technological bases, as well as basic viewpoints in promoting measures for a long-term public-private partnership and strengthening international competitiveness, basic concepts regarding methods of defense equipment acquisition, such as domestic development, international joint development and production, and import; improvement of contract systems; measures relating to research and development; measures for maintaining and strengthening defense production and technological bases, such as defense equipment and technological cooperation; and the current situation and future direction of defense equipment sectors.

See Reference 14 (National Security Strategy)
See Reference 15 (NATIONAL DEFENSE PROGRAM GUIDELINES for FY2014 and beyond)

2 Composition of the Strategy

(1) Context of Formulation of Strategy on Defense Production and Technological Bases

"The Strategy on Defense Production and Technological Bases" has made clear the following three points: (1) the context of the formulation of the strategy on defense production and technological bases and the historical positioning of this strategy; (2) characteristics of defense production and technological bases; (3) changes in the security environment surrounding defense production and technological bases.

(2) Goals and Significance of Maintaining and Strengthening Defense Production and Technological Bases

The MOD intends to (1) ensure sovereignty of security, (2) potentially contribute to deterrence enhancement, and maintain and improve bargaining power, and eventually (3) contribute to the sophistication of the domestic industry in Japan driven by cutting-edge technology.

(3) Basic Stance for Promoting Measures

The MOD intends to promote necessary measures based on the following basic viewpoints: (1) establishing long-term partnership between the private and public sector; (2) strengthening international competitiveness; (3) ensuring consistency with effective and efficient acquisition of defense equipment.

(4) Methods of Defense Procurement

Methods of defense procurement, such as (1) domestic development, (2) international joint development and production, (3) licensed domestic production, (4) utilization of commercially produced goods, and (5) imports, directly affect defense production and technological base. According to the characteristics of each type of defense equipment, it is necessary to select the acquisition method appropriately, including international joint development and production, the agile and flexible implementation of which became achievable based on the Three Principles on Transfer of Defense Equipment and Technology.

Fig. III-2-1-4 Policies for Maintaining and Strengthening Defense Production and Technological Bases

Policies for Maintaining and Strengthening Defense Production and Technological Bases	
Improvement of contract systems, etc.	❍ Use of single-tendering contracts ❍ Even longer-term contracts (integrated procurement for multiple fiscal years) ❍ Construction of a flexible system for receiving orders, in joint venture (JV) and other formats ❍ Increasing desire to lower purchasing prices and reduce business costs ❍ Strengthening of project management throughout its life cycle
Policies relating to research and development	❍ Establishment of a vision for research and development ❍ Increasing the ability to examine technology, including cutting-edge technology relating to people's livelihoods ❍ Strengthening collaboration with universities and research institutions ❍ Using and collaboration with research and development programs, including dual-use technology ❍ Funding for promising cutting-edge research for use in defense ❍ Strengthening of collaboration with foreign parties
Defense equipment and technological cooperation, etc.	❍ Deepening relationships with the United States regarding defense equipment and technology cooperation ❍ Building new relationships in defense equipment and technology cooperation ❍ Contribution to international logistics support ❍ Improve the foundations for defense equipment and technology cooperation ❍ Promotion of adapting equipment to civilian use ❍ Technology management and security
Efforts relating to defense industry organizations	❍ Promoting understanding of the necessity for defense operations and the defense industry ❍ Maintaining a robust supply chain ❍ Use of industrial organizations and contract systems
Strengthening of systems in the Ministry of Defense	❍ Consideration of efforts such as unification of departments associated with equipment acquisition, as a part of the MOD reform ❍ Consideration of the strengthening of inspection functions and the training of human resources in project management and procurement
Promotion of policies in collaboration with other relevant ministries	❍ Consideration of support measures through the use of policies of other ministries

2 The basic guideline for production and development of defense equipment, the development guideline for defense industry, and the stimulation guideline for R&D (Directive July 16, 1970)

(5) Measures for Maintaining and Strengthening Defense Production and Technological Bases

Considering Japan's severe fiscal condition, MOD will promote the following; (1) improvement of the contract system; (2) efforts regarding research and development; (3) defense equipment and technology cooperation; (4) efforts regarding defense industry organization; (5) strengthening of MOD's structure; and (6) collaborative measures with other relevant ministries.

See Fig. III-2-1-4 (Policies for Maintaining and Strengthening Defense Production and Technological Bases)

(6) Course of Action for Each Area of Defense Equipment

In deciding the MOD's principle regarding defense production and technological bases of the main defense equipment sectors (such as land equipment, supplies, etc., ships, aircraft, explosives, guided weapons, communications electronics and command control systems, unmanned equipment, cyber and space systems) the MOD will take the following flow: Based on the matters emphasized in strengthening the architecture of the Self-Defense Forces which is indicated in the NDPG, point out the future direction of the maintenance and strengthening of defense production and technological bases in each respective field and state the acquisition plan for each type of defense equipment. By deciding on the principle, efforts will be made to increase predictability for the private sector side.

See Fig. III-2-1-5 (Direction in the Various Defense Equipment Sectors (Outline))

Fig. III-2-1-5 Direction in the Various Defense Equipment Sectors (Outline)

Ground equipment	❍With regard to tanks and artillery, making use of its world-class level of strength in this area, the MOD will maintain its production and technological bases to the appropriate level. In addition, production and technological bases for mobile combat vehicles etc., will be built. ❍Through further promotion of standardization (categorization), effective and efficient acquisition as well as the maintenance and strengthening of production and technology bases of wheeled vehicles will be implemented. ❍Regarding amphibious capabilities, aspects of Japan's technological weakness will be reinforced as necessary, while defense equipment and technology cooperation that make use of our strengths will be promoted.
Supplies, etc.	❍Based on factors such as compatibility with the physical characteristics of the Japanese people, the relevant foundations will be maintained, thereby making it possible to continue the procurement of supplies from domestic companies ❍As for fields where Japan can excel, such as chemical protection equipment, adapting equipment for civilian use, and defense equipment and technology cooperation will be considered.
Ships	❍With regard to vessels, in order to enable the MOD to respond to the latest technology such as stealth capabilities, production and technological bases will be maintained and strengthened through the entry of multiple prime enterprises. ❍Consideration will be given to the bulk order of multiple escort ships with a standardized design. In doing so, a review of the format of contracts will also be considered, taking into account the effects of lowering prices. ❍Since the National Defense Program Guidelines state that the number of submarines will be increased to 22, the existing bases will be maintained and strengthened through continuous research and development for enhancing capabilities.
Aircraft	❍For the acquisition of F-35A aircraft, the MOD will make efforts to promote the participation of Japanese companies in production and to prepare for the commencement of the operation of a regional depot for F-35 aircraft in the Asia Pacific region. As for next-generation fighter aircraft, necessary measures including empirical research will be taken so as to maintain the option of the development of next-generation fighter aircraft including the possibility of international joint development of an aircraft to replace the F-2 when it is time to retire it. ❍With regard to transport aircraft and amphibian rescue aircraft, multifaceted use of the results of development such as the possibility of adaptation for civilian use, and defense equipment and technology cooperation will be promoted. For rotary-wing aircraft, keeping both the civilian and defense demand in mind, international joint development and production will be considered as an option based on the technologies cultivated through licensed domestic production and domestic development.
Explosives	❍A certain scale of procurement from domestic companies will continue to be made possible and bases, which ensure the necessary scale of explosives in various situations, will be maintained.
Guided weapons	❍In order to improve air defense performance, technological considerations regarding future SAMs will be pursued to further strengthen the relevant technological bases. A vision for research and development for the implementation of technological examinations of future guided weapons will be established including propulsion devices such as fixed rocket motors and other technologies required to improve the performance of various types of guided weapons such as the extension of their launch range. ❍Regarding international joint development as one option, efficient acquisition methods will be selected based also on the enhancement of interoperability with allied and friendly nations. ❍Along with the continuous promotion of SM-3 Block IIA Cooperative Development (SCD) between Japan and the United States, necessary measures for the transition to the production and deployment phases will be taken, considering the sustainment and enhancement of production and technological phases.
Communications electronics and command control systems	❍Research and development into cutting-edge technology for the bases required for defense will be implemented with priority, involving the improvement of the detection performance of fixed warning and control radar systems as well as the simultaneous, parallel use of multiple sonar systems. At the same time, the technological bases will be maintained and strengthened by pursuing the applicability of cutting-edge civilian technology. ❍Because systems capable of responding to battles based around network data are necessary for future command control systems, civilian technological bases, which are progressing at a significant pace, will be adopted to ensure a system replacement at the appropriate timing reflecting the latest technological standards. ❍Defense equipment and technology cooperation, as well as civilian use of wireless software technology, radar technology, which uses high-output semiconductors, and other technologies will be promoted.
Unmanned equipment	❍In light of the trend towards defense technology such as future battle conditions, smarter technologies and networking, a vision for research and development will be established and proactive research will be implemented for the enhancement of technological bases in order to present a direction of unmanned equipment whilst taking the perspective of integrated operation into account. ❍Defense equipment and technological cooperation such as research collaboration with research institutions and joint research and development with other countries will be advanced in order to raise the level of Japan's technological bases.
Cyber and space systems	❍While cooperating with the MOD's initiatives to increase its capability to respond to cyber attacks and policies relating to the use of space development, from the perspective of the defense of Japan, the future outlook of defense production and technological bases, which will be required in the future, will be discussed.