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 the MOD/SDF activities. As Japan has no national arsenal (state-owned munitions factory), most of those base is covered by companies (the defense industry) that manufacture defense equipment and associated items. Therefore, a broad range of companies, which own specialized and advanced skills and facilities are involved in the defense production and technological bases. In addition, volume efficiency of defense production is unlikely to be expected due to its market being limited to the demand from the MOD. The degree of defense demand dependence (the ratio of defense-related sales that accounts for the entire company sales) is approximately 5% on average, indicating that the defense business does not comprise the main business of many companies.

On the other hand, increasing per unit cost and maintenance/sustainment costs due to the advances in recent defense equipment and an increase in imports of foreign-made equipment, such as U.S.-made aircraft, have 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 there has been an emerging issue that some companies, which cannot handle the reduced procurement units, 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 Western defense industries and advances in international joint development and production projects. Amidst these situations, there are new changes emerging in the framework, such as the 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-3-4-1 (Current Status of the Unit Price and the Acquisition Quantity of Defense Equipment); Fig. III-3-4-2 (Trends in the Maintenance and Upgrade Expenditures for Equipment, etc.); Fig. III-3-4-3 (Current Status of Research & Development Budget); Part I, Chapter 3, Section 6-2 (Trends Concerning Defense Production and Technological Bases); Part III, Chapter 3, Section 3-1 (Three Principles on Transfer of Defense Equipment and Technology)

2 Defense Production and Technological Bases Strategy

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 “kokusankahoshin (guideline for domestic development/production).”

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 the following three points clear: (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.

See>> Reference 5 (National Security Strategy (Outline)); Reference 6 (NATIONAL DEFENSE PROGRAM GUIDELINES for FY2014 and beyond)
**Fig. III-3-4-1** 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)

**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)
- **Number of vehicles**
- **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)
- **Number of vessels**
- **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)
- **Number of aircraft**

**Fig. III-3-4-2** 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).
**Business Development Office Manager Fujikura Parachute Co., Ltd**  
**Mr. Shinya Yasuda**

Our company, Fujikura Parachute Co., Ltd, is a manufacturer, which has been making parachutes and various other kinds of life-saving equipment. Since its foundation in 1939, the company has produced and sold over 400,000 parachutes, and we are proud of our contribution to the JGSDF achieving the record of 600,000 parachute drops without any accidents, and we strive to gain our customers’ trust, placing maximum priority on human life. Two years ago, we decided to exhibit at the EUROSATORY 2014 for the first time. Following the delivery of the Airborne Parachute Type 13 developed by our company to the JGSDF and the formulation of the Three Principles on Transfer of Defense Equipment and Technology, we wondered whether the technology of our company would be accepted by the world. Thankfully, we received highly positive evaluations from many customers from all over the world, which gave us the courage to work towards entering new markets. However, it is a huge step that we enter into global market because we have done business only in Japan, so we have no time to lose for everything including overseas marketing research and global human resources development. In addition, the overseas sales of our products, which are classified as defense equipment, will not move forward without intergovernmental adjustment. While it is not easy to land on new ground, we are determined to drop down on overseas countries as a first batch, like the JGSDF first airborne brigade, in anticipation of the future defense industry and in order to contribute to the security of Japan.

**Airborne Parachute Type 13**

**The author (left) giving an explanation at Defense & Security 2015 in Thailand**
(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 (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 Equipment Procurement

With regard to the defense equipment procurement, currently multiple methods, such as domestic development, international joint development and production, licensed domestic production, utilization of commercially produced goods, and imports, are adopted. These methods directly affect defense production and technological base. According to the characteristics of defense equipment, it is necessary to select the acquisition method appropriately, including international joint development and production, I which became more agile and flexible implementation of which became achievable based on the Three Principles on Transfer of Defense Equipment and Technology.

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

Considering Japan’s severe financial condition, the MOD will promote the following measures: (1) improvement of the contract system; (2) efforts regarding research and development; (3) defense equipment and technology cooperation; (4) initiatives regarding defense industrial organizations including the building of a robust production and technology platform through understanding actual conditions of supply chain; (5) strengthening of the MOD’s structure; and (6) collaborative measures with other relevant ministries.

See>> Fig. III-3-4-4 (Measures for Maintaining and Strengthening Defense Production and Technological Bases)

(6) Courses of Actions for Each Defense Equipment Sectors

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, space systems and cyber), the MOD will take the following flow: Based on the matters indicated in NDPG to be emphasized considering strengthening the architecture of the SDF,
the MOD intends point out the future directions of the maintenance and strengthening of defense production and technological bases and the acquisition plan for each defense equipment sectors. By deciding the principle, efforts will be contributed to increasing predictability for companies.

See>> Fig. III-3-4-5 (Direction in the Various Defense Equipment Sectors (Outline))

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<th>Fig. III-3-4-5</th>
<th>Direction in the Various Defense Equipment Sectors (Outline)</th>
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| **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 industrial participation of Japanese companies in production and to prepare for the start of Regional MRO&U for F-35 aircraft in the Asia-Pacific region. As for future fighter aircraft, necessary measures including empirical research will be taken so as to maintain the option of the development of future 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 on 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. |