

Military technologies in recent years are showing remarkable advances. Against the backdrop of such technological advances, contemporary warfare increasingly features capabilities combined across all domains: not only land, sea and air but also new domains, which are space, cyberspace and electromagnetic spectrum. Aiming to improve overall military capability, states are seeking to gain superiority in technologies that undergird capabilities in these new domains. They endeavor to develop weapons that leverage cutting-edge, potentially game-changing technologies. They also engage in research of autonomous unmanned weapon systems equipped with artificial intelligence (AI). Further technological innovations in quantum technology including quantum computing and quantum cryptography and the information and communication technology (ICT) sector including the 5th generation mobile communication system (5G) will make it

even more difficult to forecast future warfare.

While Japan is facing severe financial conditions, imports of foreign equipment are increasing due to their high-performance and the complex trends of defense equipment. On the other hand, Japan's defense industry has been exposed to harsh conditions due to a downward trend in the number of procured equipment from domestic companies and other reasons.

Amid such a situation, it is essential to work on (1) reviewing equipment structure, (2) reinforcing technology base, (3) optimizing equipment procurement, (4) strengthening defense industrial base, and (5) promoting defense equipment and technology cooperation in order to ensure a necessary and sufficient defense capability in terms of both quality and quantity for the construction of a Multi-domain Defense Force.

Section  
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## Reviewing Equipment Structure

## 1 Initiatives for Construction of Optimized Equipment Structure

In order to acquire sufficient capabilities for cross-domain operations in view of the aging population with a declining birth rate and the severe fiscal situation, it is essential to further promote initiatives to optimize equipment structure. The Mid-Term Defense Program (FY2019-FY2023; MTDP) provides that the Ministry of Defense (MOD)/Self-Defense Forces (SDF) will work on the following items to build an effective and optimized equipment structure from the perspective of joint operation.

## 1 Enhancement of Joint Staff Functions

In order to examine the current equipment structure of each SDF service and build an effective and optimized equipment structure from the perspective of joint operation, the MOD/SDF will study enhancement of the equipment structure at the Joint Staff, take necessary measures, and undertake the

building of an equipment structure from the perspective of joint operation at an appropriate time during the MTDP period.

## 2 Development of Product Families, Standardization of Specifications, Joint Procurement, etc.

So far, based on a comprehensive perspective, the MOD has been striving to reduce expenses incurred in development, acquisition, and maintenance by the development of product families,<sup>1</sup> standardization of equipment specifications, and joint procurement of equipment common to all SDF services. For the development of product families, for example, the MTDP plans to introduce vehicle families of next generation wheeled armored vehicles of the Ground Self-Defense Force (GSDF) that include personnel transport type, command communication type, and patient transportation type, and develop a radar with standardized specifications as a

<sup>1</sup> This refers to adding different variations to the functions and performance of equipment to enable them to respond to different operational demands, while standardizing their basic component parts.

successor to multiple types of radar, including coastal radar and low-altitude radar of the GSDF. For joint procurement of equipment common to SDF services, Type-11 short-range surface-to-air guided missiles of the GSDF and surface-to-air guided missiles for air base defense of the Air Self-Defense Force (ASDF) share common specifications, potentially facilitating a reduction in unit prices through procurement in one contract. The MOD will examine specific effects from this effort.

### 3 Suspending Operation of Equipment of Lowered Priority

The MTDP plans to reduce the number of aircraft types, suspend the use of equipment of lowered priority, and review or terminate projects of low cost-effectiveness.

Specifically, 203mm self-propelled howitzer and other equipment whose priority is low in light of the security environment surrounding Japan will not be replaced. Biological Reconnaissance Vehicles and other equipment that are procured in a small number with low cost effectiveness will be decommissioned while maintaining the capabilities.

## 2 Initiatives to Make the Most of Limited Human Resources (Manpower Saving and Automation).....

In view of the severe security environment surrounding Japan and the rapid development of the aging population with a declining birth rate, it is important to maximize defense capability by effectively utilizing the limited human resources to the utmost. Therefore, the current MTDP plans to actively work on manpower saving and automation of defense equipment.

### 1 Initiatives for Automation

The MTDP plans to actively promote initiatives towards automation through such means as the introduction of AI to data processing and decision making regarding unit operation, the procurement of unmanned aerial vehicles (UAVs), and R&D of unmanned surface vehicles (USVs) and unmanned underwater vehicles (UUVs).

Specifically, the MOD/SDF will actively promote the use of unmanned equipment, which includes the procurement

of Global Hawk and Ship-Based UAVs of the MSDF, and consideration to introduce long-endurance UAVs to strengthen offshore surveillance capabilities on the vast Pacific side, while at the same time promoting AI utilization and related human resource development. In addition, the MOD/SDF plans to promote research on UUV with convertible mission modules and research on the detection of suspicious ships based on the analysis of data concerning an automatic identification system (AIS) using AI.

### 2 Initiatives for Manpower Saving

The MTDP plans to actively promote initiatives to save manpower through such means as streamlining in the design of new types of destroyers (FFM) and submarines and use of remote control for radar sites and other equipment. Other initiatives include the introduction of patrol vessels that can be operated by a smaller crew (about 30 members) through dedication to intelligence, surveillance, and reconnaissance (ISR).

