

Section 3 Research and Development

1 Orientation for Research and Development of Equipment and Material

Based on changes in future combat modality in light of joint operations, as well as the trend in technology enabling smarter, more networked and more unmanned conditions, the MOD is in the process of formulating a medium-to-long-term roadmap for research and development called “Research and Development Vision,” covering items that could potentially become Japan’s important defense equipment in approximately 20 years. The “Research and

Development Vision” is intended to realize effective and efficient research and development by presenting a far-sighted concept of defense equipment and a roadmap for research and development designed to achieve the concept. The MOD also aims to increase predictability for industries, and promote stable and efficient capital investment as well as staff assignment by officially publishing the vision.

2 Technical Research and Development Institute (TRDI) Initiatives

The TRDI conducts advanced research that corresponds to the needs of the Self-Defense Forces, including 1. improvement of air defense capability, 2. enhancement of intelligence, surveillance, and reconnaissance (ISR) capabilities, and 3. unmanned equipment that can be used flexibly at times of various contingencies including large-scale disasters. TRDI also makes proposals regarding highly promising technologies based on technology seeds, while adopting advanced technology for prototyping as well as testing and evaluation.

Particularly for improving air defense capability, with regard to future fighters, TRDI has been promoting strategic deliberations through research on fighter engines with high thrust using cutting-edge materials technology and research concerning system integration utilizing a simulation environment in order to verify the technological feasibility of future fighters, in addition to demonstrational research on high-mobility stealth fighter “Advanced Technology Demonstrator (ATD-X).” This will enable the fighter-related technology to be compiled and advanced within Japan, and the development (including the possibility of international joint development) of fighters to be taken into account as an option before the retirement of F-2 fighters. The decision on the development will be made by FY2018 and necessary measures will be taken accordingly.

To improve ISR capabilities, the MOD has launched demonstrational research in outer space by loading dual wavelength infrared sensors with superior detecting and discriminating capabilities developed by TRDI onto “advanced optical satellites,” which are currently being planned by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) and the Japan Aerospace Exploration Agency (JAXA). TRDI also promotes research on unmanned equipment, high mobility powered suits and other equipment that can be used flexibly at times of various contingencies including large-scale disasters.

Furthermore, from the perspective of joint operation,

TRDI has also been engaged in “operational verification research”¹ such as research on information sharing technology required for a joint data link system, which realizes high-speed and large-capacity data communication that responds to the enhancement of information capability among the three services of the SDF, as well as information diversification and complication, research on application of wireless secret communication function between the Ground, Maritime and Air Self-Defense Forces using software-defined-radio technology, and other relevant research.



Advanced Technology Demonstrator-X (ATD-X) under experimental research



High-mobility powered suits under study (image)

¹ Research to prototype or design equipment with new functions for each of the Self-Defense Forces and other organizations. The performance of the equipment etc. is identified while taking the users' opinions into account. The research enables appropriate and rapid adoption of science and technology, which is developing at a dramatic rate, and swift fabrication.

3 Technological Cooperation with Domestic Institutions

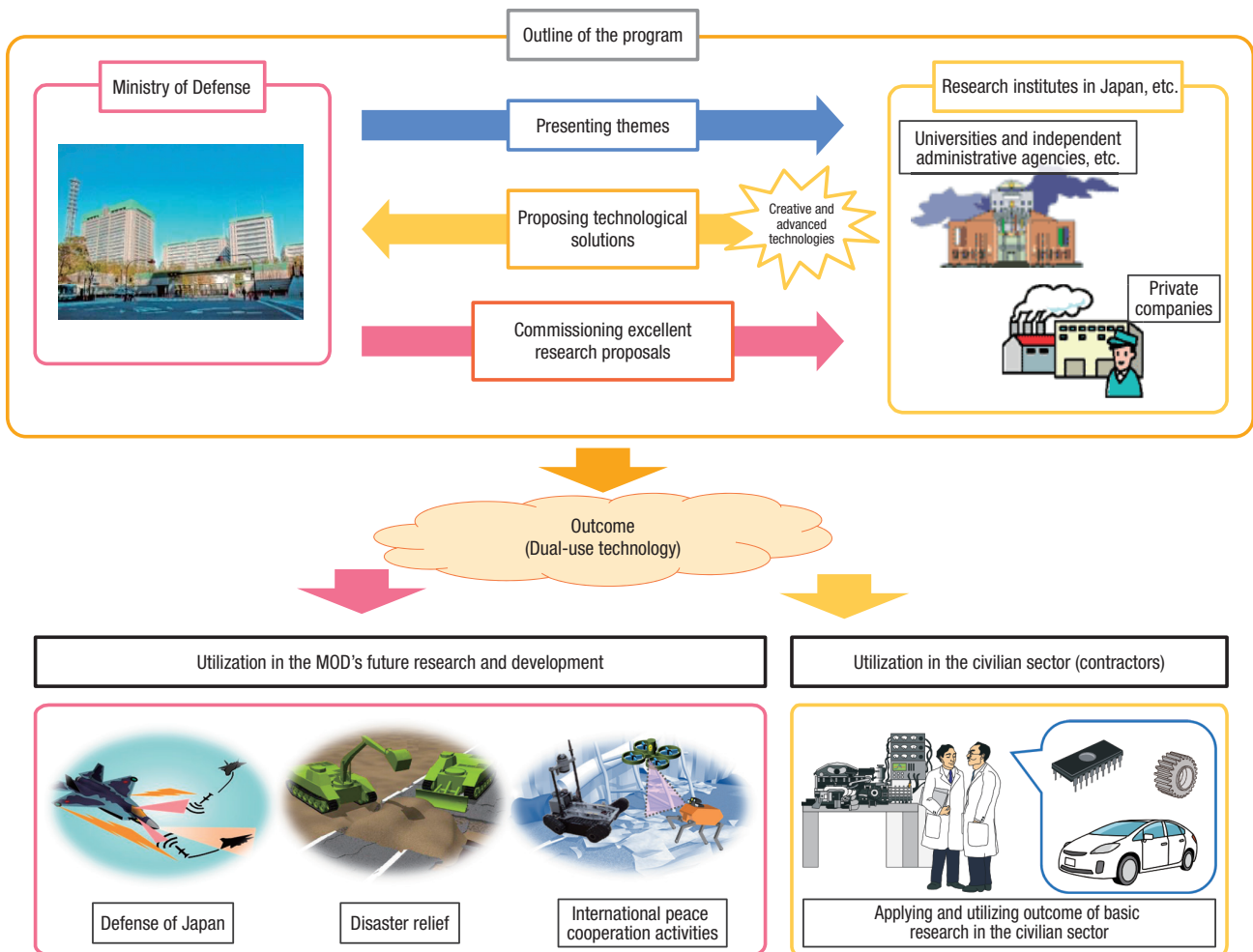
TRDI and domestic research institutions, such as independent administrative agencies and universities have been proactively working on research collaborations and technological information exchanges in order to ensure that superior civilian technology is incorporated and efficient research and development is conducted. As part of these initiatives, the MOD’s own funding program called “Innovative Science & Technology Initiative for Security” (competitive funding) was newly established in FY2015 to discover creative research conducted by the universities,

research institutes and companies etc. that are noted for their application of defense equipment, and to nurture emerging research that is deemed promising.

For strengthening the cooperation between industry, academia and government as well as promoting open innovations, the outcome of research cooperation with research institutions, including universities and the Innovative Science & Technology Initiative for Security Program, should be open to the public in principle.

See Fig. III-2-3-1 (Image of the Innovative Science & Technology Initiative for Security Program (Competitive Funds))

Fig. III-2-3-1 Image of the Innovative Science & Technology Initiative for Security Program (Competitive Funds)



Section 4 Defense Equipment and Technology Cooperation

Based on the Three Principles on Transfer of Defense Equipment and Technology, Japan promotes cooperation in defense equipment and technology with other countries in order to contribute to promoting the maintenance and

enhancement of defense production and technological bases, as well as contributing to the promotion of peace and international cooperation.