

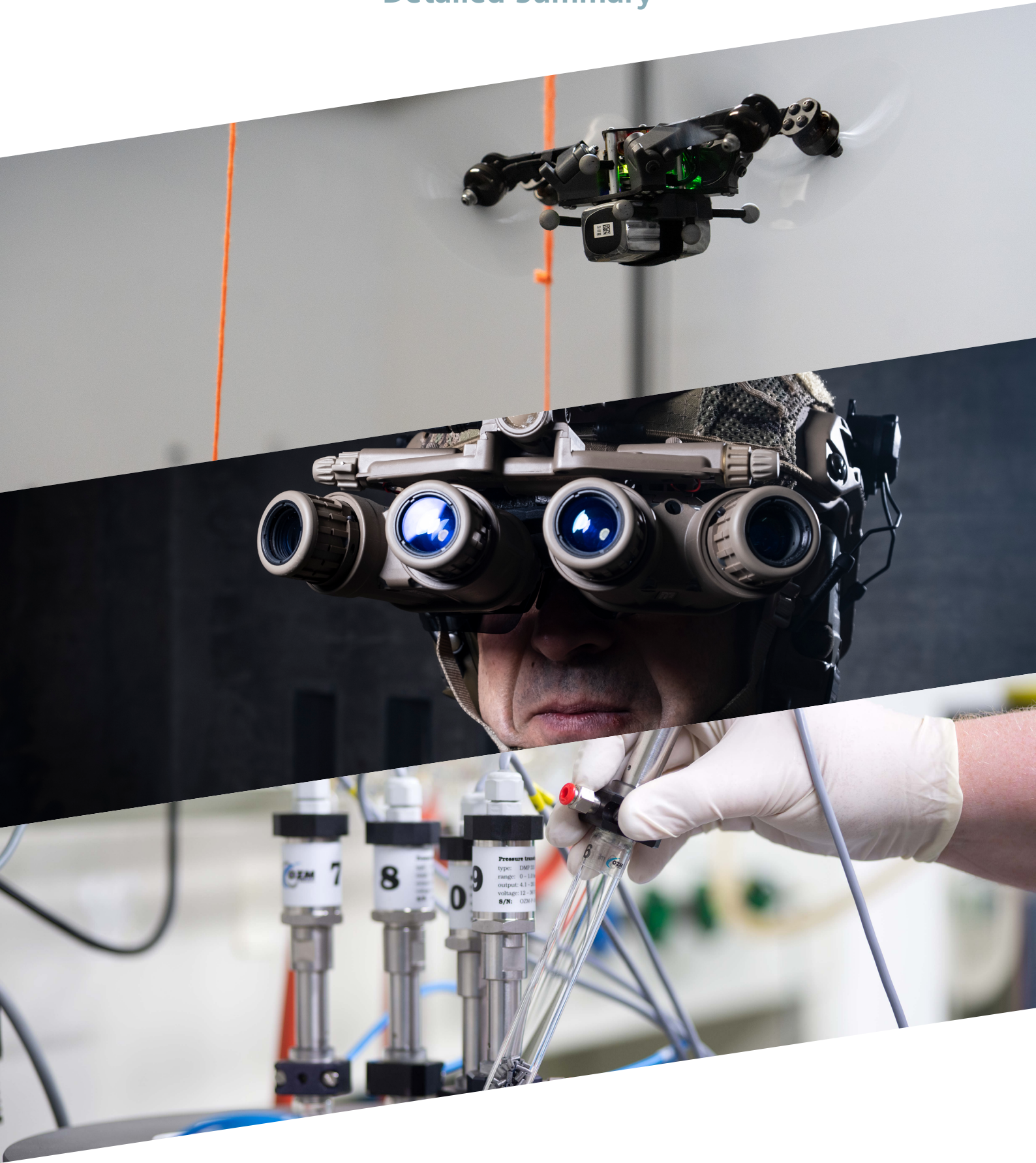


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armasuisse
Science and Technology

Long-Term Research Plan 2025 - 2028 of armasuisse

Detailed Summary



The Long-Term Research Plan (LTRP) 2025-2028, published by the Swiss Federal Office for Defence Procurement armasuisse, outlines the research priorities and approaches for the next four years to ensure Switzerland's security. This plan aims to develop technical and scientific expertise to support the Swiss Armed Forces, the Federal Intelligence Service and The National Cyber Security Centre with independent and well-founded expert opinions. The research also seeks to foster technology-driven innovations within the Swiss Federal Department of Defence, Civil Protection and Sport (DDPS). This plan acknowledges

the impact of recent global events, such as the COVID-19 crisis, the war in Ukraine and the Middle East conflict, which have highlighted the vulnerability of societies and economies and increased interest in security policy. The plan highlights the crucial role of research in maintaining

armasuisse's expertise in security-relevant technologies, supporting the capability-oriented development of the armed forces and fostering technology-driven innovation. The LTRP defines four interconnected research priorities, each with specific thematic areas.

Technology Foresight

This area focuses on identifying disruptive technological developments and assessing their implications for security policy. It aims to reduce planning risks for security forces and identify new research topics.

Technology Monitoring

The continuous observation of technological developments, the identification of technological drivers relevant to Switzerland's security and tracking of civilian technology developments with potential military applications. It also comprises the assessment of the maturity of security-relevant technologies, the evaluation of their future applicability by security forces and the determination of the disruption potential of technologies.

Technology Impact Assessment

Focuses on the consequences of technological developments, aiming to anticipate potential future scenarios related to national security and the organization of the armed forces. A key aspect of this research is identifying technologies with high disruption potential and anticipating their impact in both military and civilian contexts.



Technologies for Operational Capabilities

This priority examines the impact of technology on the operational capabilities of security forces, focusing primarily on the effects of new technologies within the Observe-Orient-Decide-Act (OODA) loop, as well as the principles of action and protection.

Impact and Protection in Physical Space

Focuses on optimizing the physical impact of forces, considering mobility, effectiveness and vulnerability, along with the precision and range of weapon systems. It also deals with the development of protection measures for personnel, equipment and infrastructure, including active and reactive protection solutions. This includes research into the detection and defense against hypersonic and autonomous weapon systems. Another focus is the safety of explosives and ammunition.

Operations and Protection in Cyber and Electromagnetic Space (CER)

Aims to achieve and maintain information superiority in the CER through strong self-protection and targeted operations. This consists of early detection of cyber risks, the improvement of defense measures and countermeasures and the search for vulnerabilities in systems. It also encompasses the monitoring of new attack vectors and the development of technologies for secure data processing.

Technologies for Generating Information Superiority

Focuses on the acquisition of targeted and timely information through various means such as human intelligence (HUMINT), imagery intelligence (IMINT), signal intelligence (SIGINT) and open-source intelligence (OSINT). It also involves the development of communication systems, and the creation of comprehensive situation reports using artificial intelligence (AI). This includes research into AI's robustness, explicability and the ethical challenges involved in its use.

More about our research:



Technology Integration into Platforms

This area concentrates on integrating diverse technologies into platforms to demonstrate their potential in a lab or near-operational setting. It aims to bridge the gap between research and application through demonstrators.

Autonomy and Robotics

Explores the use of robotic systems on land, water and in the air, focusing on human-machine interaction and acceptance, multi-robot systems and the ethical and legal issues of autonomous systems. This area also investigates the potential of unmanned systems and their integration into military applications.

Space Technologies and Alternatives

Investigates the use of space for military purposes and the potential of alternatives to satellite-based services such as navigation and time synchronization. This entails the development of space situational awareness, the evaluation of satellite constellations and the development of satellite and mission competencies. It also includes measures and countermeasures for the protection of space-based assets and international cooperation.



Cross-Cutting Themes

Sustainable and Self-sufficient Energy Supply

Focuses on the development of sustainable energy solutions such as renewable energy sources, energy storage and sustainable fuels, aiming to achieve the climate goals of the Swiss government and ensure operational readiness. This consists of the investigation of new technologies for mobility of military vehicles, self-sufficient infrastructure and the energy supply of mobile troops.

Simulation and Analysis

Focuses on the development of simulation tools and AI algorithms to support the Swiss Armed Forces development, operational planning, decision-making and training. This involves the development of holistic simulation environments and the use of digital simulations for scenario implementation, including war gaming.

Human Factors

Addresses the interaction between humans and technology, focusing on resilience and methods to improve human performance. This includes the study of human-machine interactions and acceptance, the strengthening of the individual resilience of army personnel, and the investigation of the effects of cognitive warfare.

Strategic Implementation Principles

User Orientation: The research is focused on the needs of the Swiss Armed Forces and armasuisse.

Technology Readiness Level (TRL): The research is concentrated on technology readiness levels 3 to 5.

Technology Lifecycle: The research considers the entire technology lifecycle to avoid late or premature technology adoption and malinvestments.

Medium- to Long-Term Horizon: The research aims to identify technologies that could have a lasting impact on the capabilities of the armed forces.

Competencies through Cooperation: Long-term networks with partners from academia, industry and international organizations are crucial.

Multidisciplinary Networking: The research emphasizes a holistic approach, integrating different disciplines.

Actors and Interfaces

Universities and non-profit research institutions: These are strategic partners, forming the backbone of the technically oriented research.

Small and medium-sized enterprises (SMEs) and start-ups: These partners contribute to the dynamic development of economic systems.

Defense companies: These offer valuable integration services for modern technologies.

Other federal agencies: Coordination with other agencies ensures the utilization of synergies and the avoidance of duplications.

International cooperation: Collaboration with the scientific organisations of the European Defence Agency (EDA) and the North Atlantic Treaty Organization (NATO) strongly promote international knowledge exchange and bring great benefits for Switzerland.

Organization

The internal organization of armasuisse's research is managed by the Science and Technology division. Research programs are developed based on the needs of the Swiss Armed Forces, and the implementation is ensured by designated research program managers.

Knowledge Dissemination

Research results are disseminated through annual reports, workshops, conferences and publications. The knowledge is used for the development of armed forces, innovation projects and the deployment of new technologies.

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