Summary Report: 21st SSF Security Talk
«Drones - Gamechanger in the Military and Civilian Sector»

The 21st SSF Security Talk focused on the rapid development of drone technology and its impact on military, security, and civilian applications. Switzerland is one of the world's leading innovation hubs in this field, but regulation, security, geopolitical risks, and dependence on foreign manufacturers pose major challenges.

Input Presentation 1 – Prof. Dr. Michel Guillaume, Head of the Center for Aviation, ZHAW

Michel Guillaume began by providing a comprehensive technological overview of modern drone systems. He highlighted the fundamental paradigm shift from manned to unmanned systems and emphasized how ubiquitous drones have already become in the civilian sphere – from agriculture and inspections to research and logistics.

Drones are much more than just flying machines – they must be understood as "unmanned aircraft systems" that always consist of several interoperable elements: the human component, the command and control system, take-off and landing facilities, the unmanned aircraft itself, the payload, and the necessary data connections.

The variety of applications is enormous – as are the challenges: safety, data protection, integration into existing airspace structures, and social acceptance. Guillaume emphasized that unmanned aircraft must meet the same high safety standards as civil aviation as a whole.

Looking ahead, he concluded by discussing how AI-controlled, autonomous, and coordinated flying marks the next technological leap. AI can be used, for example, for the cooperation and flight coordination of a swarm of drones, for processing large amounts of data, or for detecting anomalies such as malfunctions or cyberattacks on the drones themselves.

Input Presentation 2 – Dr. Thomas Rothacher, Head of Science and Technology, armasuisse

Thomas Rothacher classified the role of drones in a military context and presented the Drone Task Force, which has been tasked since 2024 with expanding capabilities across the entire spectrum of unmanned systems for the Swiss Armed Forces.

He impressively demonstrated how much drones have developed in the military sector. Experience from current conflicts – particularly in Ukraine – shows that successful operations are hardly possible without the use of UAVs. Drones perform key functions in reconnaissance, anti-tank warfare, and precision support for troops. At the same time, the enormous consumption of systems is becoming apparent, posing new challenges for industrial production.

With its drone task force, Switzerland is pursuing the goal of developing key technologies domestically wherever possible, reducing dependence on other countries, and shortening innovation cycles. The four focus areas include improvised attack drones, carrier platforms, swarm technology, and nano, micro, and mini drones as multi-purpose systems.

Rothacher emphasized that new procurement models are necessary: instead of lengthy traditional armament processes, the task force is focusing on a dynamic ecosystem of industry, science, and the army. Speed, innovation, and reliable cooperation are crucial to strengthening Switzerland's defense capabilities in a tense geopolitical situation.

Input Presentation 3 – Dr. Julie Villinger, Head of Meteorology, Meteomatics AG

Dr. Julie Villinger presented how Meteomatics, a Swiss company, uses highly specialized drones in the civil sector to take weather data to a new level, becoming a leading global provider of weather information.

She demonstrated how weather drones close a critical gap in conventional measurement systems, which led to inaccurate forecasts in cases such as fog, storms, or local severe weather. Regular vertical measurement flights in various regions of Switzerland enable significantly more accurate models to be created. In addition, compared to conventional methods such as weather balloons, drone technology offers the advantage that drones are reusable and can fly much more frequently, resulting in more regular data recording. The Meteobase, a fully automated take-off and landing platform, enables operation even in winter conditions, including automatic data processing. Meteomatics has permits for BVLOS flights and for flights at altitudes of up to 6,000 meters.

The highly accurate weather data generated in this way is used in a wide range of areas, from energy and utilities to transportation and logistics to government agencies. Precise weather data is also playing an increasingly important role in the military environment – for example, in detecting icing conditions and improving the accuracy of weapon systems. Meteomatics is thus demonstrating how Swiss drone technology can create concrete security-related added value.

Panel discussion

In the ensuing discussion, the experts explored the technological requirements for secure drone systems, specific applications and countermeasures, and Switzerland's international positioning.

<u>Technology & Operation – Requirements for Safe Drone Systems</u>

Prof. Dr. Michel Guillaume highlighted the basic technologies that are essential for safe drone operation: navigation systems such as GPS, robust communication and data connections, reliable sensor technology, and accurate weather assessment. He emphasized that drones must be subject to the same high safety and certification standards as civil aviation. Social acceptance, technical redundancy, and careful integration into existing airspace structures are key prerequisites for sustainable use. The improvised, mass use of drones in conflict areas – such as Ukraine – is therefore not comparable to the security-oriented reality in Switzerland, where reliability is a priority.

Philipp Eder, Head of Drones & Robots at Swisscom Broadcast Ltd., supplemented this technical perspective with concrete solutions from practice. Swisscom is developing tools that enable the safe operation of drones beyond visual line of sight: mobile coverage in the air, ground risk calculations based on mobile data, and the establishment of an Air Scout network for detecting

other air traffic participants. These elements create an increasingly accurate picture of the situation and improve flight safety in uncontrolled airspace.

Drone use & defense

Markus Eggenberger, Chief of Security Police for the Graubünden Cantonal Police, provided insight into the police's experiences in deploying and defending against drones. The Graubünden Cantonal Police is one of the pioneers in dealing with drone systems: the first drone detection systems were deployed during the WEF in 2016. Today, the police have a specialized unit with a dual mission – deployment and defense. Drones are a valuable tool for security authorities for reconnaissance and situation assessment, but at the same time they also pose a potential threat to events and critical infrastructure.

The development of drone defense is progressing dynamically. While there was hardly any talk of concrete defense measures in 2017, several technologies have established themselves in a short period of time. Eggenberger described the practical evolution: from net launchers – based on police rubber bullet guns – to jamming, i.e. the targeted disruption of radio signals, to modern methods that make it possible to determine the position of the drone pilot or even take over the frequency and control the drone. Today, a combination of all three methods is usually used in practice.

Cooperation within the Swiss Security Network plays a central role in this. In the drone working group, the police, the federal government, Armasuisse, the air force, and other stakeholders coordinate their knowledge, develop recommendations, and harmonize processes – an example of successful cooperation between civil, security police, and military sectors.

Philipp Eder then presented Swisscom's planned drone network: a nationwide network of around 300 drones that could support security-related applications in particular as an airborne emergency service – from incident management to automated inspections.

Dr. Jürg Wildi, member of the board of directors at Meteomatics AG and partner at v2sky, followed up on this and provided insight into Meteomatics' successful model. The company's approach deliberately differs from that of many other drone manufacturers: the focus is not on the drone, but on a clearly defined data requirement. Only then is the appropriate drone platform developed. This reverse development path – first the specific use case, then the technology – has made Meteomatics internationally successful.

At the end of the thematic block, Markus Eggenberger emphasized the security policy framework. The geopolitical situation remains tense, and drone attacks have become an established means of conflict, especially against critical infrastructure. Switzerland must continue to invest in technological developments in order to be able to effectively counter threats. While the country is currently dependent on foreign systems in many areas, its own strength lies primarily in the operation and integration of various technologies.

Where does Switzerland stand in international comparison?

In the third thematic block, the experts discussed Switzerland's international positioning, as addressed by Markus Eggenberger.

Michel Guillaume emphasized that although Switzerland has a high level of innovative strength and several successful start-ups, industrial scaling poses major challenges. Europe currently has no company that can produce drones on the scale of a manufacturer such as DJI. Examples showed the difficult path to sustainable industrialization. In many areas – e.g., universities or emergency services – there is therefore a reliance on foreign, mostly Chinese systems, which also raises security issues – for example, with regard to software, data protection, and upgrade cycles.

Philipp Eder described Switzerland as technologically advanced within Europe and noted that it has authorities such as the FOCA that are actively involved in this field. Nevertheless, international competition remains fierce: China has enormous production capacities and a wide range of technologies, while the US is also investing heavily. The real challenges for Switzerland lie in industrial ramp-up, cost efficiency, and the ability to provide drones in large numbers safely and affordably – a crucial factor for many civil and security police use cases.

In this context, Thomas Rothacher explained how the Drone Task Force intends to establish a new form of procurement to meet precisely these challenges. Instead of traditional, lengthy armament processes, the task force is focusing on a disruptive, dynamic approach: the establishment of a Swiss ecosystem comprising industry, science, and the army is intended to accelerate innovation, strengthen the domestic supply chain, and reduce technological dependencies. The short innovation cycles in the drone sector require flexible networked systems that can react quickly. Rothacher expressed confidence that this change in mindset can be achieved with the partners involved.

The 21st SSF Security Talk, attended by around 100 interested guests, impressively demonstrated that drones play a key role in Switzerland's security, both military and civil.
Stakeholders from research, industry, the army, and the police are already working closely together. At the same time, major strategic tasks lie ahead, such as building resilient Swiss drone technology and industrial expertise, further developing regulations, ensuring safe operation in increasingly complex airspace structures, and strengthening defense capabilities through agility, cooperation, and innovation.

Drones are no longer a niche topic – they shape security, infrastructure, mobility, and crisis preparedness in equal measure. The SSF will continue to accompany and deepen this dialogue.