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Rescue and security: national mobile broadband secure communications system (MSC)

In brief

- To perform their work effectively, **emergency services** such as the police, fire brigade and ambulance service, as well as customs offices, border guards, operators of critical infrastructure and other civil protection organisations all require secure communication channels, whatever the situation.
- The current secure radio network, Polycom, **will be supported only until 2035**. Moreover, it is designed primarily for voice communication and is incapable of transmitting large data volumes.
- The Swiss Federal Council is therefore planning to introduce **a new, national mobile broadband secure communications system (MSC)**. This initiative, which was largely instigated by various user groups within the emergency services, centres around the exchange of large volumes of data (images, videos and live streams).
- **MSC makes extensive use of synergies within current civil and military networks**, such as existing antennas, while also being designed to function independently of other networks. Important locations are bridged, or 'hardened', to protect against power failures. MSC is based on open mobile communication standards, which also enables the use of commercially available devices.
- Satellite-based networks do not currently meet the needs of the emergency services. **They have too many restrictions, such as a limited number of simultaneous connections and a loss of reception within buildings.** Such networks are also more susceptible to disruption by third parties.
- To ensure that a suitable successor system to Polycom is in place by 2035, the **MSC project must be launched as soon as possible**.

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Ensuring effective communication in all situations using mobile technology

- Emergency services such as the police, fire brigade, ambulance service, operators of critical infrastructure and other civil protection organisations require secure communication channels, especially in crisis situations. Central to this is the exchange of large data volumes (photos, videos, live streams) or communication with robots and drones. The emergency services currently use their own narrowband secure radio network called Polycom, which is primarily intended for voice communication. To overcome this limitation, many emergency service personnel make parallel use of civil mobile communication networks.
- The Polycom voice communication network is already slated for retirement, with its continued availability guaranteed only until 2035. The Swiss Federal Council is therefore planning to introduce a new, **national mobile broadband secure communications system (MSC)**. This initiative, which was largely instigated by various user groups within the emergency services, is currently far behind schedule.

Satellite-based networks are not yet sufficiently technically mature

- At present, a purely satellite-based network is unable to meet the needs of the emergency services, with the features available failing to live up to the marketing hype.
- Owing to current limitations, a satellite communications network for Switzerland would require users to maintain a distance of 50 km from the country's borders. As well as making such a system impossible to use in areas close to the border, it would also present significant problems throughout the Swiss Plateau. These networks also offer a very limited number of simultaneous connections and do not provide coverage within buildings.
- Satellite-based networks are highly reliant on third-party providers. Even if Switzerland were to place its own satellites in orbit, they would be vulnerable to disruption by third parties – an action that is much more difficult when using a terrestrial network. A system of this kind would clearly lead to a loss of autonomy.

Use of existing antennas and hardening

- The MSC network uses the existing antenna infrastructure provided by civilian mobile communication networks. It is, however, designed in such a way that the applications used by the security and rescue services operate independently of the civilian network. MSC requires only the limited establishment of additional antenna sites in certain locations.
- If a power failure occurs, standard Swisscom antennas are designed, in future, to operate using a backup battery for four hours. For MSC, strategic locations will be bridged for longer (referred to as 'hardening'). The strategic locations used for Polycom to date have been equipped with diesel generators. More future-proof options, such as battery storage, are being examined for use with MSC. As an added benefit, these could stabilise the electricity grid and reduce electricity demand peaks by acting as virtual power plants.

Advantages of the MSC concept: standard technologies and equipment with a terrestrial network

- In contrast to Polycom, the MSC approach is based on open mobile communication standards (3GPP), which enables the use of commercially available standard equipment and ensures that developments relating to satellite technology can also be integrated. The MSC backbone is a terrestrial (earthbound) network that provides maximum resilience and autonomy.

Outlook

- To ensure that the emergency services have a suitable successor system to Polycom in place by 2035 at the latest, the MSC project must be launched as soon as possible. The MSC concept draws on a large number of synergies with existing civil and military networks. It provides a self-sufficient and resilient solution for the Swiss security and rescue organisations, while simultaneously addressing the needs of emergency service personnel. It is both forward-looking and capable of supporting future developments such as satellite communication.

- **MSC** stands for 'national mobile broadband secure communications system'. It will serve as a communication channel for emergency service personnel in all situations and is intended to replace Polycom. MSC draws on a number of synergies between civil and military networks.
- **Hardening** refers to the bridging of power failures at an installation using its own power supply so that the emergency services are able to communicate in any situation.
- **Polycom** is the current secure radio network for the emergency services. It no longer meets modern requirements for the exchange of data, and support for this system will expire in 2035.
- **Terrestrial** refers to earthbound networks. This covers both wired networks and radio applications that use antennas on the Earth's surface – as opposed to satellites.
- **BORS** is the German abbreviation for 'rescue and security authorities and organisations'.

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