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Options for NBC-Protection in the Milieu of Terrorism

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NBC stands for nuclear, biological and chemical threats and risks, which require protection from their possible effects. The three images of N, B and C threats differ dramatically. In the event of an N-incident, protection from radioactively-contaminated fine dust particles is required. B-incidents primarily require protection from infectious viruses, bacteria, and spores. Finally, C-

incidents have shown that gaseous substances (gases and vapours), liquids and solid micro-particles (aerosols) could be deployed. Physical protection from these threats is fundamentally based on two methodical foundations – the retention of gaseous substances and the retention of aerosols.

What protection possibilities are available in Switzerland:

Protection of the respiratory tract

Protection of the respiratory tract is of primary significance, since penetration of harmful substances through the respiratory system, as well as the eyes, generally poses the greatest danger.



This protection is accomplished with a protective mask. The main feature of this mask is the NBC-protection filter, consisting of an aerosol filter (fibreglass paper) and an adsorption-based gas filter part (impregnated active carbon). The inhaled air is filtered, retaining harmful materials. A properly-fitting protection mask with filter has an elimination factor of over 10,000, which means a maximum of one out of ten thousand micro-particles can penetrate the filter. Thus, the gas concentration is reduced by a factor of ten thousand. This applies to all relevant harmful gaseous substances and aerosols, with the exception of carbon monoxide and nitrogen oxides. Thus, reliable protection is guaranteed. Protection against B-agents (viruses, bacteria, spores) is also guaranteed. The few B-agents, which are mobile, are found on the border layer

of the impregnated active carbon (chromium, copper and silver salts) under inhibitory growth conditions, so that a "grow through" of viruses, bacteria, and spores into the filter media is not expected.

Protection of the skin

Some C-weapons can also penetrate through the skin. As protective material, permeable NBC protective suits are available in Switzerland, as well as impermeable NBC-gloves and NBC-boots. This combination offers sufficient protection against radioactive dust (N) and harmful gaseous substances (C). However, the capacity to retain aerosols and, therefore, also B-agents is slight. However, this does not particularly weaken the total protection, since the uptake of infectious agents through the skin is not significant, according to B-experts at SPIEZ LABORATORY.



Protection in shelters

Swiss shelters (military and civil) offer the best protection against NBC weapons and NBC harmful substances. Due to the constant overpressure during filter operation, the incoming fresh air reaches the interior spaces after passing over a built-in filter facility with an NBC protective filter (collective filter). The collective filter is built, in principal, the same way as the filter in the protective mask and effectively retains harmful gaseous substances, as well as aerosols. Total protection offered by the shelters is significantly greater than that of the protective mask.

Special aspects of B-protection

In Switzerland, NBC-protective materials are available that protect against B-agents. However, their use is hardly of current interest for the following reasons. The latency period for observation and recognition of symptoms, which allow the first recognition of B-deployment, is so great that putting protective measures into place is only possible after the greatest probability of infection has already passed. Since terrorists determine the location, time, and type of attack, NBC-protective material must always be worn for prevention. However, this is senseless and the high psychological stress makes this almost impossible. Equally senseless would be a preventive occupation of protective spaces or shelters. An alternative would be vaccination against the most common forms of biological agents.

Conclusion

The available options for protection and protective measures in Switzerland conform to the high standards of western armies and in the case of civil protection shelters, even exceed the requirements. Today, effective protection is provided against conceivable N-, B- and C-incidences with respect to NBC-weapons associated with terrorist actions. Finally, these options are the result of a thorough and practically oriented application of basic research in the area of NBC-protection, and the concurrent quality testing at SPIEZ LABORATORY.