Shelters

their purpose, construction and utilisation

Schweizerische Eidgenossenschaft
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Federal Office for Civil Protection FOCP

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A long-term investment in protection and security

In Switzerland, collective shelters have been systematically built for the population since the introduction of an obligation to do so in the 1960s. In the event of an armed conflict, every resident should have a place of refuge close to their home. The shelters designed for this purpose are standardised, simple, robust and cost-effective.

After the end of the Cold War, this practice came under increasing public pressure. In peacetime, spending to protect against war is not very popular. However, the security situation can deteriorate any time and Switzerland could potentially be affected by armed conflict.

The Federal Office for Civil Protection (FOCP), together with its cantonal partners, remains committed to ensuring that Switzerland's protective infrastructure is maintained and completed where gaps still exist. Setting up a comprehensive system of protective buildings is a long-term task that could hardly be achieved if we were starting it from the ground up today. It is therefore important to maintain and build on our existing system. Protective structures can also be used in case of disasters and other emergencies. In the last two decades, the obligation to build shelters has been loosened because of the high number of existing shelters and the relaxed security policy situation. However, the obligation still exists in principle.

The start of the war in Ukraine in February 2022 marked a turning point in security policy – a departure from a trend that began with the fall of the Berlin Wall. The population's interest in protective measures and especially in shelters has increased suddenly and dramatically. With this brochure, the FOCP is addressing the population's need for information.

This brochure is aimed at the general public and in particular at shelter owners. It provides information on the obligation to build shelters, the purpose of these shelters and how they protect people, how they are built and how they must be equipped, maintained and used in peacetime. It also describes how in the event of a growing threat shelters will be set up and how people will be assigned to them.

Construction has been standardised, but there exist different types of shelters. This brochure describes shelters that can accommodate up to 200 people, and touches on some of the different shelter types. It provides a good overview of shelters – an important element of the Swiss security system.

For further information, visit
www.civilprotection.ch/shelter.

Shelters: principle and readiness

As a rule, every inhabitant in Switzerland should have a place in a shelter. Today, we are close to achieving this goal from the 1960s. In the event of an armed conflict, Switzerland's population would be able to move into shelters.

Still local gaps
There is enough room for around nine million people in Switzerland's 370,000 private and public shelters. While this is a coverage rate of over 100%, there are still local gaps and differences between cantons. There are not yet enough shelters in all of Switzerland's inner cities and surrounding areas.

Ensuring value retention
There is an obligation to build shelters, especially where it is necessary to fill existing gaps and accommodate increasing population numbers. Today, however, our focus is no longer on building new shelters, but rather on maintaining the value of our existing infrastructure.

Ready in the event of a threat
The authorities continuously monitor and assess developments in the security situation. If an armed conflict in Switzerland or in a neighbouring country is imminent, the local authorities will assign residents to a shelter as a precautionary measure. Shelter owners must be able to make their shelters operational and ready for use within five days.

Personal responsibility with the support of Civil Protection
The Civil Protection Organisation provides support to residents moving into and staying in shelters. In the event of an armed conflict, the Federal Council may reinforce the Civil Protection Organisation with former members of the organisation and former members of the armed forces and the civilian service. However, the population and especially shelter owners also bear a certain level of personal and joint responsibility. The idea is to help people help themselves.

The purpose and protective effect of shelters

Protective structures are built in preparation for war. They provide protection against the effects of various weapons. They can also be used as emergency shelters during disasters and other emergencies.

Protection thanks to a concrete shell and ventilation system
Shelters are designed to serve as a place of refuge for the population during an armed conflict. They provide basic protection against the direct and indirect impact of a wide range of weapons. Ventilated shelters with concrete outer shells offer a high chance of survival in most threat situations.

Protection against conventional weapons
Protection against close hits and secondary effects (such as debris from the blast) is very high. However, shelters offer little protection against direct hits from conventional weapons. The shelter's solid outer shell is able to resist at least 10 tonnes of pressure per square metre (i.e. 1 bar), which means the shelter can withstand a building collapsing on top of it. Shelters can therefore also serve as emergency accommodation.

Protection against nuclear weapons
Shelters, with their robust outer shells, can protect against the effects of nuclear weapons. They effectively shield occupants against air blasts, heat, debris, tremors, radioactive primary radiation and fallout – as long as they are not in too close proximity to the explosion. They can also shield against radioactive radiation in case of a radiation accident.

Protected against biological and chemical weapons
Shelters also protect against biological and chemical weapons, as they are equipped with an NBC filter that cleans contaminated outside air. The pressurisation inside the shelter prevents contaminated outside air from entering.

Shelter setup and components

Switzerland has different types of shelters: the smallest fit five people, the largest over a thousand. No matter their size, the same principles and requirements apply to all shelters, as in Switzerland they are largely standardised. This document describes shelters for up to 200 people and shows some of the different types.

Protection is key
Shelters are primarily about providing protection. They are designed and equipped to be functional, effective in terms of cost and space requirements, and easy to maintain. This is also reflected in their size: each shelter has a floor area of (at least) 1 m^2 and a volume of 2.5 m^3 per occupant.

Outer protective shell and openings
The outer shell (floor, walls and ceiling), which is constructed with reinforced concrete, is what gives shelters their ability to withstand impacts. Openings are sealed off with blast doors and covers, which are also made of reinforced concrete.

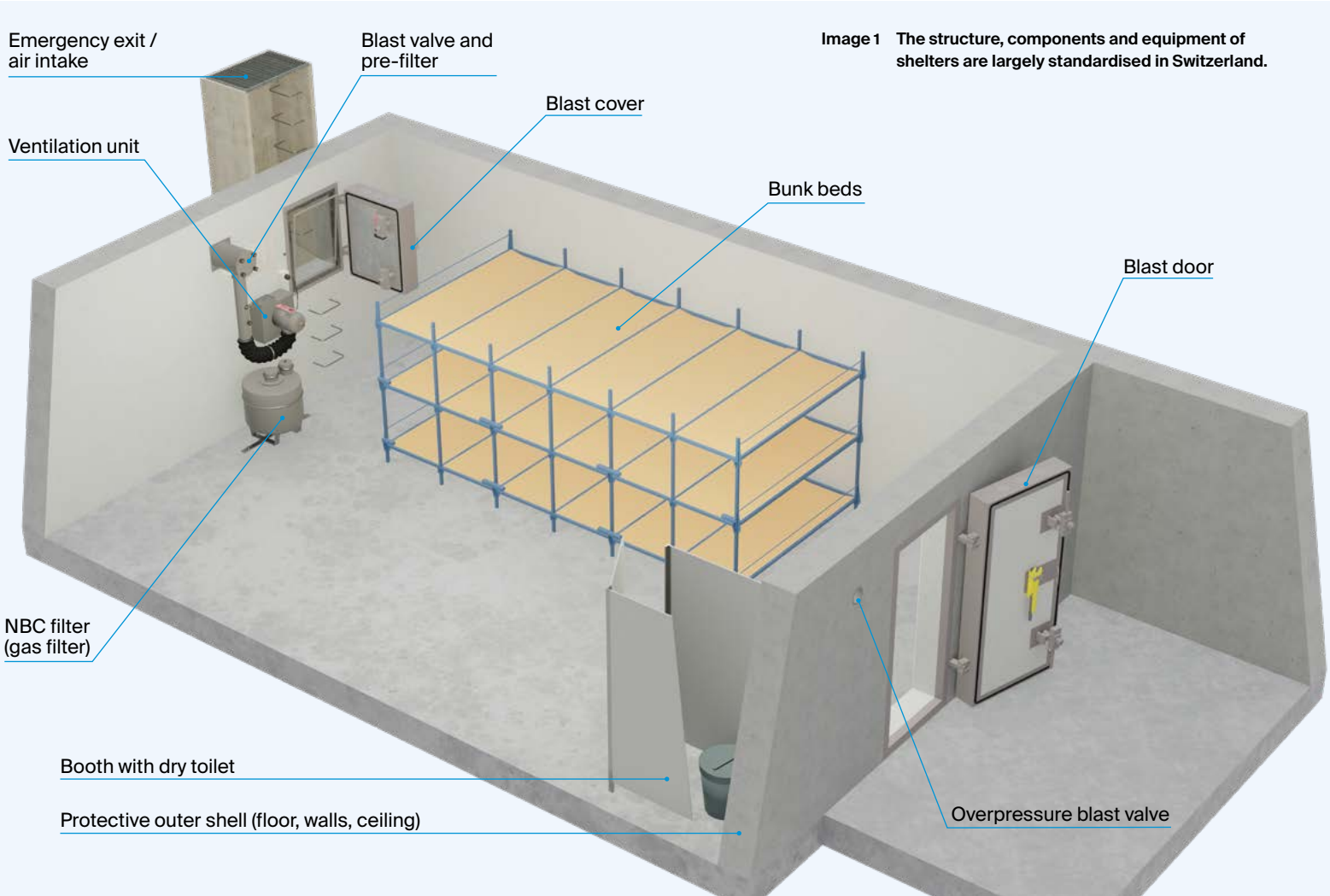

Image 1 **The structure, components and equipment of shelters are largely standardised in Switzerland.**

Emergency exits
Every shelter has an emergency exit or escape tunnel to ensure people can get out even if the entrance is no longer usable – for example if the building has collapsed on top of the shelter. The emergency exit runs along the building's outer wall and leads outside. Buildings with an eaves height of more than four metres are required to have an escape tunnel. This ensures that the escape exit will not be buried under rubble.

Ventilation system
A shelter's ventilation system comprises:
– an air intake
– a blast valve and pre-filter
– a ventilation unit (blower)
– an NBC filter (gas filter)
– an overpressure blast valve (at the entrance)

The electric or manually operated ventilation unit provides fresh air in the shelter. In the event of a chemical or biological threat, the NBC filter can be connected to the system. Overpressure blast valves create overpressure in the shelter, which prevents unfiltered air from entering the shelter. They also protect against pressure waves and vacuums that can follow a blast.

Airlock
Large shelters have an airlock that makes it possible to enter and exit without any outside air getting in when the ventilator is on.

Sanitary facilities
Generally, the only sanitary facilities inside the shelter are dry toilets (one for every 30 occupants). Some shelters, however, are equipped with flushable water toilets and even showers. As far as possible, occupants should use the sanitation systems in the building or their private accommodation.

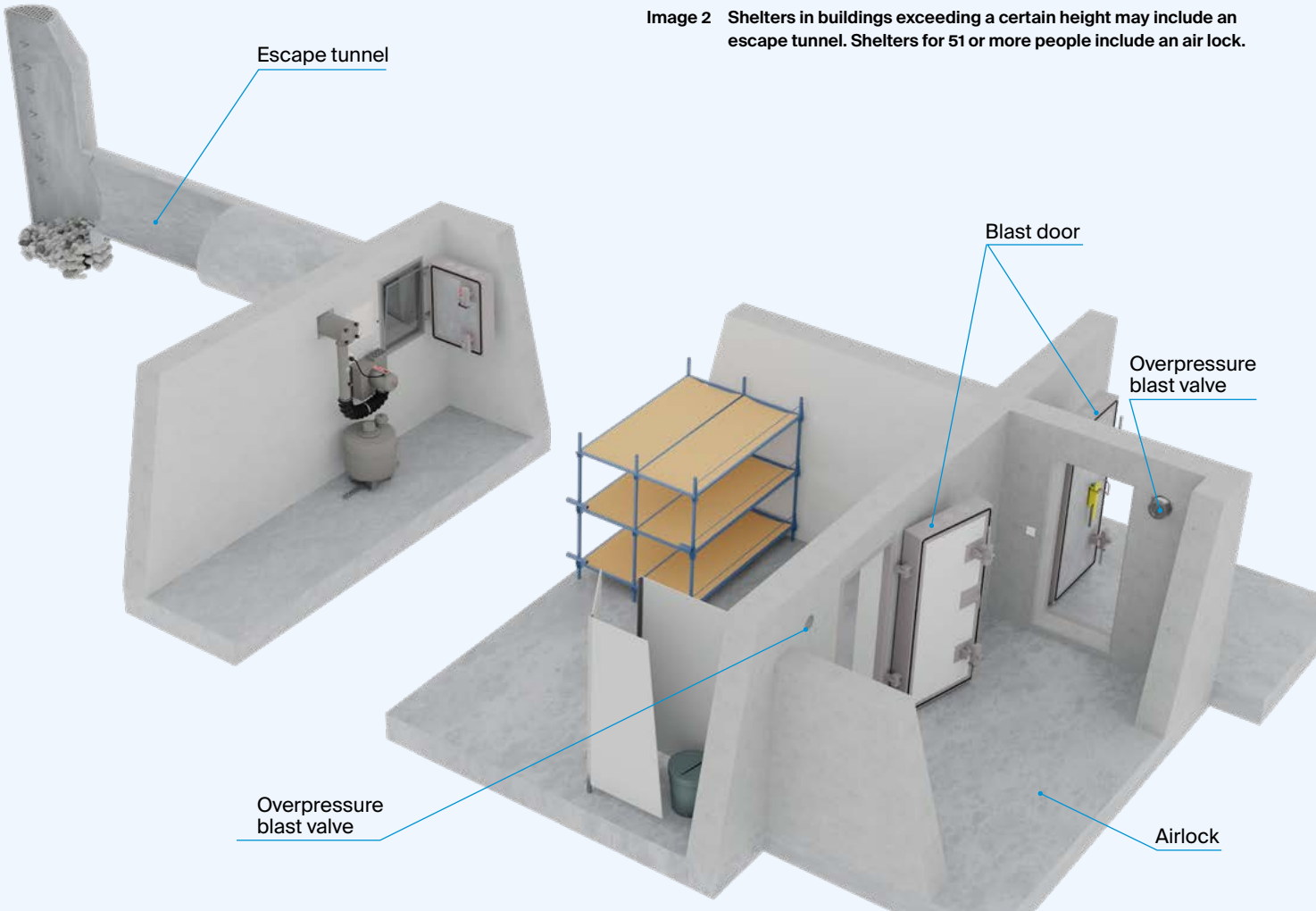

Image 2 **Shelters in buildings exceeding a certain height may include an escape tunnel. Shelters for 51 or more people include an air lock.**

Equipping, using and maintaining shelters in peacetime

Shelter owners must ensure that their shelters are equipped and maintained to function in the event of armed conflict. In peacetime, however, they are free to use the space for other purposes.

Supplies: bunk beds and dry toilets
If you are the owner of a shelter, it is your responsibility to ensure that it is ready for an extended stay. Since 1987, the legally required equipment for a shelter consists of bunk beds and dry toilets. In shelters for more than 30 people, permanent booths should be provided for the dry toilets. The equipment must be stored near the shelter – its exact location must be indicated in the shelter.

Daily personal use
Shelters can be used in everyday life for storage, as a cellar, arts and crafts or play room, an archive or for other purposes. If you use your shelter in this way, remember that the regulations regarding occupational safety, electrical installations, fire protection, etc. apply, and that the shelter's outer shell (floor, walls, ceiling), blast doors and covers, and ventilation system cannot be altered in any way. Before altering or modifying the structure of the shelter or its systems, you must obtain approval by the relevant authorities.

Maintenance obligation
As a shelter owner, you must maintain your shelter and its facilities, and ensure they remain accessible. This applies in particular to the inspections carried out by the authorities (at least every ten years). Simple maintenance includes ensuring the shelter and emergency exit are clean. If you find any defects or malfunctions, contact your commune or canton's civil defence office for information on how to proceed.

Image 3 **In everyday life, people are free to use their shelters as storage rooms or cellars, for example. However, they must not compromise their shelter's functionality.**

Preparing and setting up a shelter

Shelter owners must be able to make their shelters operational and ready for use within five days. If the authorities issue an order to move into the shelters, owners must provide access according to the allocation plans. The shelters must then be cleared out and furnished – if necessary, following instructions from the civil protection authorities.

Checking components
Before a shelter can be furnished and people move in, its various components must be checked and prepared to ensure they are in good working order. You should note the following points:

Preparing blast doors for operation
People and material need to be able to enter and leave the shelter through its entrance. But the blast door must also fulfil its protective purpose. To ensure both, certain measures need to be taken when preparing the shelter entrance:

- Take the unarmoured doors that are usually used in peacetime off their hinges and, if necessary, unscrew and remove the door frame.
- Check the fit of the rubber seal and, if necessary, press it into the groove.
- Make sure that the blast doors close and the locking mechanisms work.
- Check the self-release mechanism, which consists of a (square) opening in the door frame, a key, square tube, threaded rod (i.e. a large screw) and a nut.

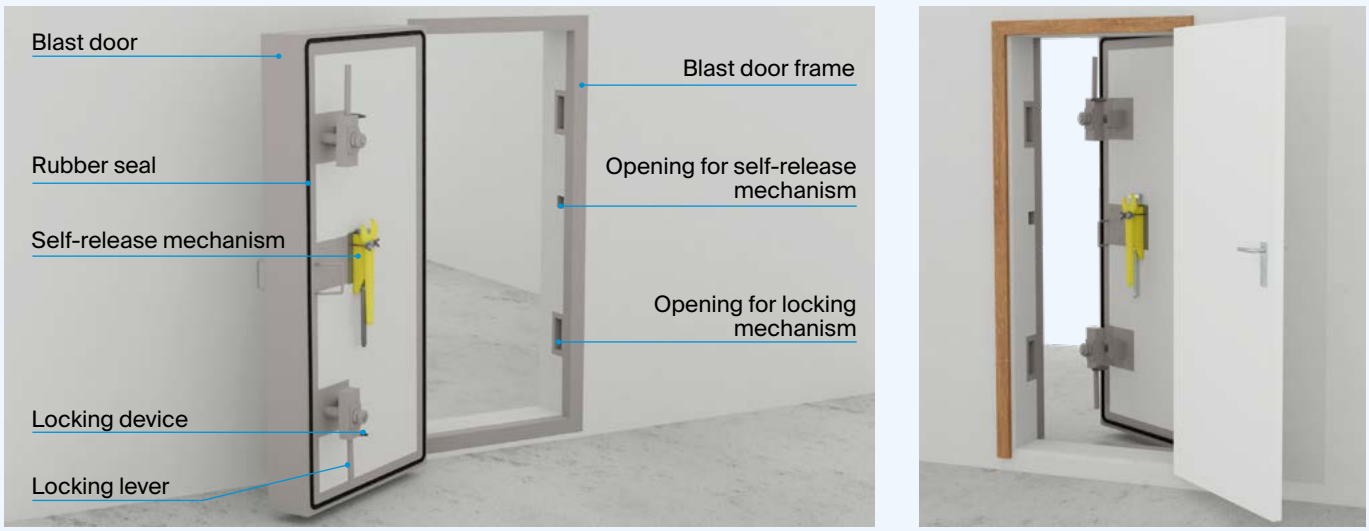

Image 4a/4b **When setting up your shelter, it is important to make sure that all components are present and in working order. The blast door must provide access, but also protection. The unarmoured door must be removed when preparing to move in to the shelter.**

Image 5a/5b **To make them more accessible in everyday life, some shelter entrances do not have a threshold in place. The removable threshold, which you may find attached to the blast door, must be screwed to the floor when preparing the shelter for use.**

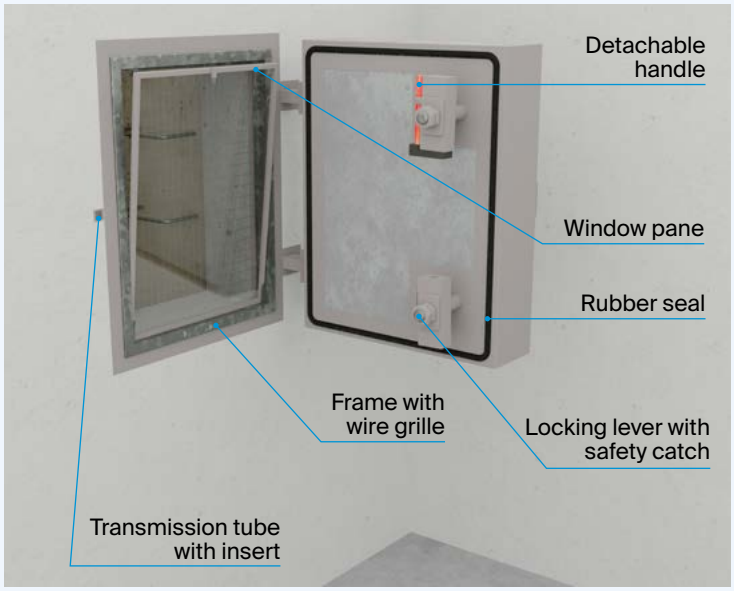

Image 6 **The emergency exit is closed with the blast cover. The shelter's air intake is also located in this area.**

Special case: blast door with removable threshold

- Remove the protective plugs from the threaded holes at the bottom of the door frame.
- Screw the threshold on tightly using all the screws.

Preparing blast covers for operation

Like the blast door, the blast cover that closes off the emergency exit also has a protective purpose to fulfil. The shelter's air intake is also located in this area. The following measures must be taken before moving into the shelter:

- Check the emergency exit (or escape tunnel); ensure it is unobstructed and clean it if necessary.
- If present, unhinge and remove the window and window grille; if necessary, unscrew and remove the window frame.
- Check the fit of the rubber seal; if necessary, press it into the groove.
- Make sure that the blast cover can be closed and that the locking mechanism works.

Preparing the ventilation system

The ventilation system is the lungs of your shelter. The following measures must be taken before moving into the shelter:

- Check the overpressure blast valves; confirm that the valves close on their own.
- Check the air intake; if necessary, clean the grille in the intake pipe (usually located inside the emergency exit) and the shaft cover to ensure air supply.
- Check the shelter's outer shell for unsealed openings (e.g. cable conduits).
- Check the ventilation unit (blower):
- Clean the pre-filter if necessary (e.g. by tapping it).
- Empty the condensation trap.
- Set the throttle valve to 'fresh air volume' (blue mark).
- Close the shelter openings (blast door and cover).
- Check flexible hose and its connector clamps for any defects; switch on the electric drive of the ventilation unit and check whether you can turn the hand crank in the direction indicated by the arrow, and that the air volume indicator reaches at least the blue mark; switch off the electric drive.
- Insert the hand crank, turn it in the direction indicated by the arrow, and check whether the blue mark on the air volume indicator can be reached without much effort.

Image 7 The ventilation unit with its NBC filter is essential for ventilating the closed shelter. It can be operated both electrically and manually.

– Switch the electric drive back on; check whether the air volume indicator reaches the blue mark and whether the air volume can be regulated using the throttle valve.
– Check that the overpressure blast valves are open and do not rattle.
– Check whether the seals on the NBC filter are intact.

Clearing out the shelter
Apart from the ventilation system, lighting and standard equipment (beds, toilets), everything inside the shelter must be removed as a matter of principle. Any additional, non-standard ventilation equipment must be dismantled and all openings sealed. Do not store any flammable material in the rooms immediately adjacent to or above the shelter. Underground rooms adjacent to the shelter should be used wherever possible to store supplies and other items that are important for the stay but that cannot be accommodated in the shelter.

Setting up and equipping the shelter
When setting up a shelter to be used for a few hours or days, the shelter and necessary equipment must be prepared. The bunk beds and dry toilets must be brought in and set up according to the instructions. The civil protection or communal authorities can provide support to private shelter owners. In the case of older shelters (built before 1987), some of the equipment may be missing. The FOCP recommends that these shelters be updated.

Further preparations
The shelter is now basically ready for use. However, further measures are recommended:
– Mark the way to the shelter to make it easier to find.
– Ensure you have a working radio inside the shelter (the authorities will transmit instructions and other information via the VHF transmitter network).
– If possible, set up a common area with tables and chairs, and storage space for personal belongings.
– Define areas (inside and outside the shelter) to keep food and water.

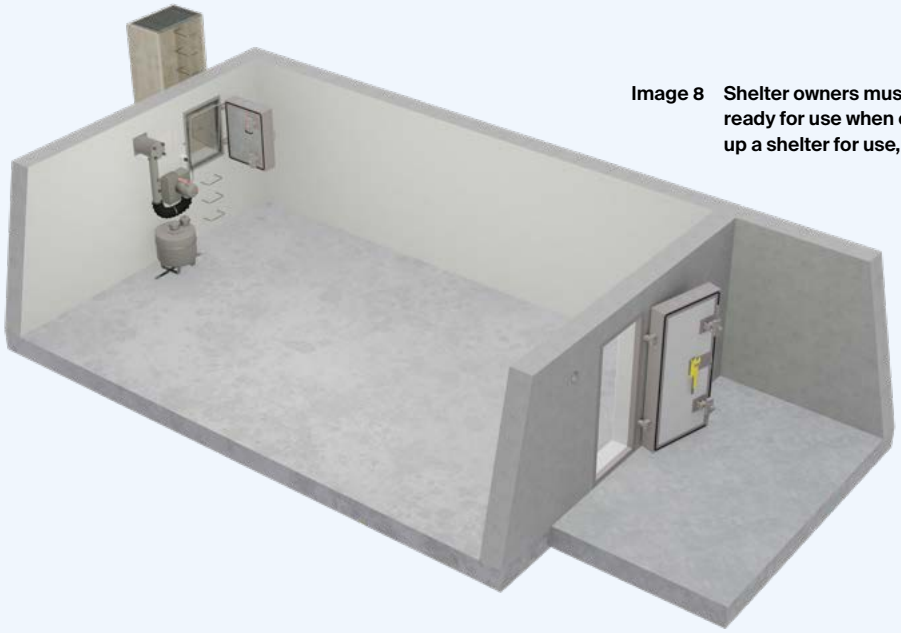

Image 8 Shelter owners must be able to make their shelters operational and ready for use when ordered to do so by the authorities. When setting up a shelter for use, it must first be cleared out.

Image 9 The required equipment consists of bunk beds and dry toilets. They must be brought into the shelter and set up according to the instructions.

Image 10 For stays ranging from hours to a few days, the shelter can be furnished with a table and chairs, for example. It is important to ensure a supply of food and water. Occupants are personally responsible for this.

Allocation of shelter spaces and moving into a shelter

In the event of a threat, the authorities will disseminate information to the population and issue the order to move to shelters. The cantons and communes already plan the allocation of shelters in peacetime. The population should also prepare for emergencies by stocking up on supplies and making contingency plans.

Current allocation planning
The cantons and communes are required to plan the allocation of shelters and to update their plans regularly. Shelter allocation is announced when the security situation requires it. The communes and cantons can provide information through various channels, for example on websites, signs, by post and/or in person (for example with the support of the Civil Protection Organisation).

By official order
If the authorities order people to move to shelters, you will be told which shelter you have been assigned to. The population should be given enough time to move into the shelters and to set them up for stays ranging from a few hours up to a few days, in the event of an acute threat.

Emergency supplies and emergency plan
Even in peacetime, it makes sense to have an emergency plan in place and keep supplies on hand in case of disasters, emergencies or armed conflict. Ask yourself, “How can I contact members of my family?”, “Where will I go?”, “What will I take with me?” Having an emergency plan in place will help you act quickly and appropriately in an emergency. In principle, everyone should have enough food supplies to feed themselves independently for several days. In the event of an armed conflict, emergency supplies (especially drinks and non-perishable food) can usually be stored in or near the shelter ahead of time.

In case of acute danger
Before leaving your home and moving to the shelter, observe the following points:
– Follow the authorities› instructions.
– Take emergency luggage (including personal documents) with you.
– Take food (including specialised and baby food) and medicines with you.
– Close windows and doors, switch off electrical appliances, shut off gas lines and extinguish open fires (e.g. fireplaces, candles).
– Inform neighbours and offer support if they need it.
– Accommodate pets as well as you can and provide them with food and water.

Further information

You can find more information at:
- www.civilprotection.ch/shelter
- What to do in case of danger / emergency plan: www.alert.swiss
- Emergency supplies: fones.admin.ch (→ Topics)

If you have questions or notice something is wrong with your shelter, contact your commune or canton's civil protection office for more information.

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