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Instruction ZGRD-00-031

Small structures on and under overhead line pylons

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Summary

Overhead line pylons and the areas below them often offer the only opportunity to implement environmental support measures (small structures) on intensively farmed agricultural land. Line operation must remain safe and unrestricted. This instruction sets out the conditions for installing small structures on and under overhead line pylons owned by Swissgrid and defines the corresponding distribution of roles.

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1 Initial situation

The Swiss landscape is lined by high-voltage pylons at regular intervals. They are often found on intensively farmed agricultural land or along linear infrastructures such as watercourses or transport routes. The areas under the pylons are mostly inaccessible for machinery and are therefore hardly suitable for intensive cultivation. This means that they are among the few sites where environmental support measures (especially small structures) do not directly collide with other interests and consequently have great potential for habitat enhancement and connectivity projects.

2 Objective and purpose

As the operator of the high-voltage grid (voltage: 380 and 220 kV), Swissgrid is responsible for the safe operation and maintenance of its systems. At the same time, it is aware of the potential of its pylons and pylon areas for environmental support measures and is open to requests of this kind, provided they do not jeopardise security of supply.

This instruction sets out the conditions under which Swissgrid authorises the construction or installation of small structures under or on its overhead line pylons. The aim is to ensure that the small structures do not represent a technical risk.

3 Responsibilities and tasks

Grid Maintenance Manager (GMM) Swissgrid	Swissgrid plant manager; responsible for the maintenance of the relevant infrastructure (e.g. pylon, substation). Decides whether the small structure may pose a risk to operations (technical justification required). Approves the small structure and forwards the request to the Swissgrid forester.
Swissgrid environmental expert	Contact person at Swissgrid for environmental issues; coordinates enquiries from project applicants and arranges the necessary contacts. Responsible for receiving the request (environment@swissgrid.ch), for clarifying feasibility with the GMM and for carrying out internal digitisation.
Swissgrid forester	Commissioned to draw up safety instructions and arrange acceptance with the project applicants. Responsible for annual verification of the maintenance of small structures along the entire route (even outside forest areas). If maintenance is not carried out as agreed in writing, the Swissgrid forester will contact the land manager. If maintenance is still not performed, the forester can ask Swissgrid to remove the small structure and inform Swissgrid's environmental expert.
Project applicant	Party that initiates, coordinates and/or implements the project to create a small structure (e.g. planning office, environmental organisation, etc.). The enquiry is sent directly to Swissgrid's environment department (environment@swissgrid.ch). The project applicant is obliged to construct the small structure in accordance with the safety instructions and to carry out an acceptance procedure with the Swissgrid forester. Responsibility for maintenance lies with the project applicant.
Land manager	Party responsible for the maintenance of the small structure (e.g. landowner or project applicant themselves)

Table 1: Responsibilities and tasks

4 Legal basis and technical regulations

Federal legal basis:

- Ordinance on Heavy Current Installations (SR 734.2, Heavy Current Installations Ordinance)
- Ordinance on Electrical Lines and Cables (SR 734.31, OLE)

Technical regulations:

- Earthing as a protective measure in electrical installations (SNG 483755)

5 Basic principle

The operation and maintenance of the extra-high-voltage line must be guaranteed at all times and must not be jeopardised or made impossible by the small structure.

Pylon foundations and supporting structures must remain accessible and climbable at all times (including during the breeding season, spawning season, etc.) to allow the operation and maintenance of installations.

In most cases, it is not possible to construct a small structure near a pylon with an antenna system on it, as the mobile phone providers have to be able to lift their material from the pylon centre.

The construction of a small structure or the installation of a nesting box is only permitted with the express consent of Swissgrid. Swissgrid and the project applicant must conclude an agreement on the specific location and agree on all the details before the small structure is set up.

6 General provisions

6.1 Project coordination and documentation

Enquiries regarding small structures or other environmental projects should be addressed to Swissgrid's environment department (environment@swissgrid.ch), which coordinates the requests and forwards them to the appropriate department within the company.

The location of each small structure must correspond precisely to a specific pylon (details: route/pylon number, TR0000x000) and be authorised by Swissgrid.

The planning and design of the small structure must be submitted to Swissgrid with the project description. The following information is required at the very least:

- Project documentation (objective (type), method / procedure / maintenance instructions) including a sketch of the structure showing the distances to the pylon construction.
- Pylon locations (route no. x pylon no., pylon coordinates LV-95)
- Contact details of the project applicant (originator)
- Maintenance regulations (contact details of the land manager)
- Maintenance instructions – maintenance must be ensured so that the small structure fulfils its purpose

The consent of the landowner, easements, official requirements such as planning applications, etc. must be obtained and complied with by the project applicant for each small structure.

6.2 Installation

The pylon foundations, anchor stones and supporting structure must not be altered or damaged by the small structure.

The forester must inform Swissgrid in advance before starting any work (construction, dismantling) on the small structure. Before the small structure is built, safety instructions will be provided by the Swissgrid forester following discussions between the GMM and the forester.

6.3 Maintenance and removal of small structures

The small structure must be maintained as follows:

- The land manager or project applicant maintains the small structure in accordance with the maintenance instructions in the project documentation. If maintenance is not carried out as agreed, Swissgrid reserves the right to have the small structure removed at the project applicant's expense.
- The Swissgrid forester monitors the maintenance of the small structure and contacts the land manager and/or project applicant in the event of non-compliance.

Once the small structure has been constructed, the project applicant must request acceptance from the Swissgrid forester. The Swissgrid forester informs the Swissgrid environmental expert after successful acceptance. All authorised small structures, including the related project description, must be registered in Swissgrid's geoinformation system (GIS) (by Swissgrid's environmental expert).

If a small structure is removed, this must be reported to the environmental expert. The Swissgrid environmental expert informs the GMM and the Swissgrid forester accordingly. If the small structure is removed by the Swissgrid forester, this must also be reported to the environmental expert.

6.4 Security measures / access for persons

The presence of the contractual partner or third parties engaged by them in the immediate vicinity of the pylon must be kept to a minimum, as life-threatening voltages can be caused by lightning strikes or malfunctions during operation. In the event of a thunderstorm, all persons should immediately leave the vicinity of the pylon and seek shelter in a nearby building.

Supporting structures may only be climbed by Swissgrid personnel or persons authorised by Swissgrid. Climbing by the contractual partner or third parties is prohibited.

The small structure should not increase the likelihood that persons will spend time in the immediate vicinity of the pylon. This means that a pylon cannot be assigned to a higher area classification in accordance with Art. 54 para. 2 of the Ordinance on Heavy Current Installations (Heavy Current Installations Ordinance). Upgrading the area classification pursuant to Art. 54 Para. 2 lit. a of the Heavy Current Installations Ordinance is not permitted.

6.5 Costs and liability

The small structure must not hinder the maintenance, expansion or extension of the pylon site. If the small structure causes an obstruction, it must be dismantled at the project applicant's expense. Swissgrid must not incur any costs as a result of the small structure.

Construction and specific maintenance (and dismantling if necessary) of the small structure are at the expense of the project applicant. The project applicant and land manager make specific maintenance arrangements (services, compensation, duration) between themselves.

Swissgrid reserves the right to request the modification or removal of the small structure at any time. Swissgrid or its service providers accept no responsibility for damage to the small structure caused by maintenance work.

If the maintenance of the small structure is not carried out by the project applicant or land manager despite a warning from the Swissgrid forester, the removal of the small structure will be ordered by the Swissgrid forester at the expense of the project applicant.

If the overhead line is dismantled, there is no entitlement to a replacement area for the small structure.

6.6 Elements under overhead line pylons

All pylon bases must be freely accessible and must not be obstructed or planted in a buffer area of 1.5 metres from the pylon base (not the corner posts) (see Figure 1).

- The small structure must be designed in such a way that pylons can be climbed at any time without hindrance.
- No changes to the terrain are permitted in the buffer area of 1.5 metres around the pylon base. Changes in the topsoil/substrate are possible (e.g. to supplement the small structure), for instance from grass to gravel or sand.
- If the small structure is elevated (e.g. bushes, piles of branches), a minimum distance of 1.5 metres from the supporting structure of the overhead line pylon must also be observed (risk of fire load).
- No buildings / walls made of concrete or mortar may be erected.
- The small structure and any plants must be limited to a maximum height of 1.5 metres.
- Plants should not have any thorns.
- Pylons and supporting structures may not be used for attaching or growing plants.
- Biotopes must be sealed with waterproof film, plastic or clay. Conductive materials are not permitted for the construction of small structures 20 metres around the pylon and in the pylon area. Plastic trays and tubs are also prohibited due to the risk of tripping and injury. Only natural building materials may be used.
- Water inlets and outlets must not be made of conductive material.
- Fences are not permitted.
- No small structures may be erected under the cantilever.

Soil in the vicinity of corrosion-protected metal structures such as extra-high-voltage overhead lines can be contaminated by pollutants (e.g. zinc, lead, etc.). If soil needs to be displaced during the construction, maintenance or dismantling of the small structure, it is the responsibility of the project applicant to ensure that the work is done professionally in accordance with the Swiss soil excavation guidelines.

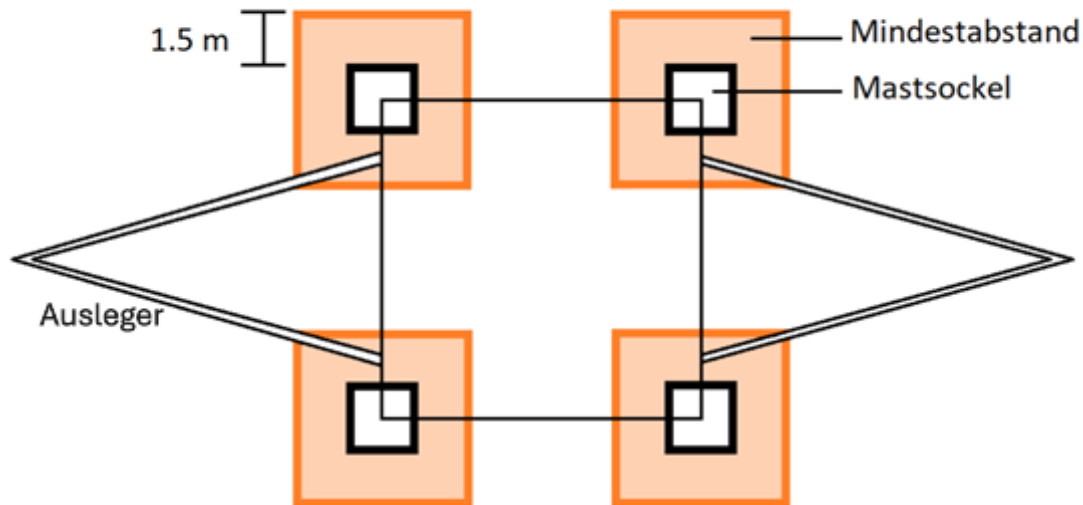


Figure 1: Pylon surface with a buffer area of 1.5 metres from the pylon base (not the corner posts)

6.7 Elements on overhead line pylons (nesting aids)

A specific agreement must be signed between Swissgrid and the project applicant for installing nesting boxes on overhead line pylons.

- Supporting structures may only be climbed by personnel assigned by Swissgrid. Climbing by third parties is prohibited.
- The installation, maintenance and dismantling of elements on overhead line pylons must be carried out under the supervision of personnel assigned by Swissgrid. The costs incurred will be borne by the project applicant.
- To ensure that pylons can be climbed unimpeded, the small structure must not be attached to the corner posts.
- Nesting aids must be attached without drilling into the pylon structure.
- The attached elements must remain at a minimum vertical distance of 7 metres from the lowest conductor at all times
- No structural analysis is required for small structures weighing less than 10 kg and with a wind-exposed area of less than one square metre. In all other cases, the decision is up to Swissgrid.