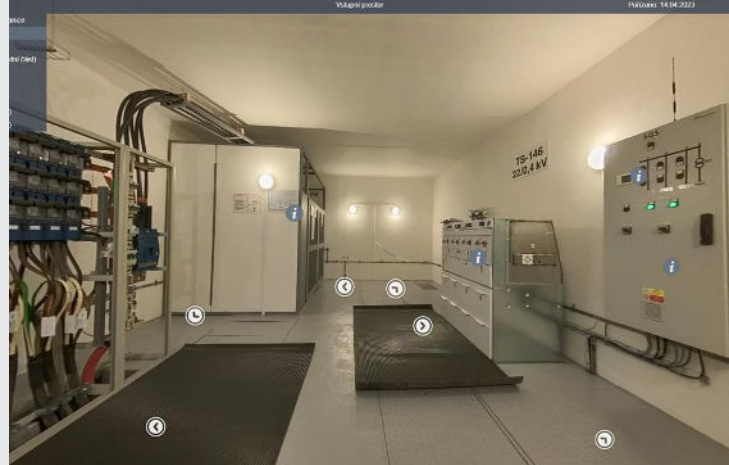


SUCCESS CASE 30.2024

TS360

TRANSFORMER STATION
PHOTO DOCUMENTATION

Enhancing the current asset management system to manage transformer station photo documentation.

THE CHALLENGE

Due to grid smartification, the transformer station (22/0,4kV) technology is now more subject to modifications while more pilot projects are implemented and new technologies are tested. **Photo documentation of transformer substations** taken during installations is currently unavailable or practically unusable for technicians outside of the specific department that originally recorded it. Additionally, the presence of undocumented technology from pilot projects complicates maintenance work in the substation.

THE SOLUTION

The **TS360 solution** was put into operation by PREdistribuce following three major steps:

- 1) Definition of use cases and benefits for different Distribution System Operator (DSO) departments.
- 2) Setup of a uniform procedure for taking photo documentation and specification of the necessary level of detail.
- 3) Adaptation of the existing asset management application to make the documentation available to all authorised staff.

The project was launched in 2022 starting with discussions across DSO departments. The key benefit given by the solution is the availability of basic visual information before the visit of technicians to the station. The purpose of this information includes:

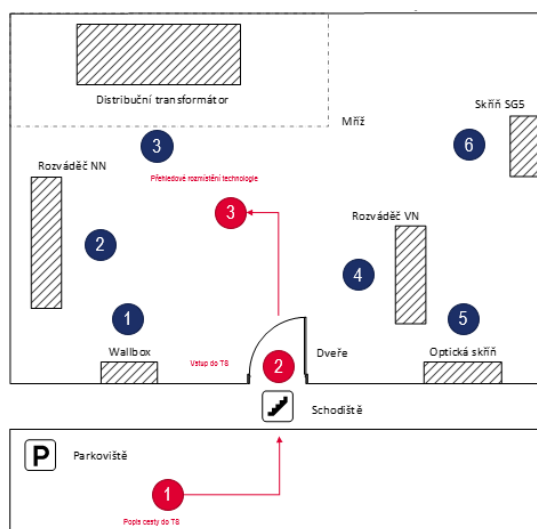
- Facilitated access to the station and to the box used for storing its keys.
- Identification of the entrance layout of external metering cables.

- Overall visualisation of the technology and its placement within the station.
- Detailed view of the selected technology (e.g., inside of the control cabinet, on the identification plates of the devices, on temporary pilot project installations).
- Identification of options for future installation of other technologies (e.g., optical cabinet).

Thanks to this solution, the user can move around the station in the same way as one uses *Google Street View*. By clicking on the relevant marker, the user can visualise the details of the selected technology.

PHOTO ACQUISITION AND PROCESSING

- A 360° camera is placed on selected points (*marked in blue or red in the picture*) allowing the capture of a panoramic view of the facility. A standard photo of every component or device detail is also acquired. An important aspect is to place the camera so that the access path to the station is easy to follow.
- In the post-processing phase, all data are merged with a special application. Details, arrows and info points are added.
- Subsequently, the whole photo documentation is uploaded to the existing asset management application including the date on which the documentation was taken.
- After this stage, only the actual status of the documentation is shown (without its history).

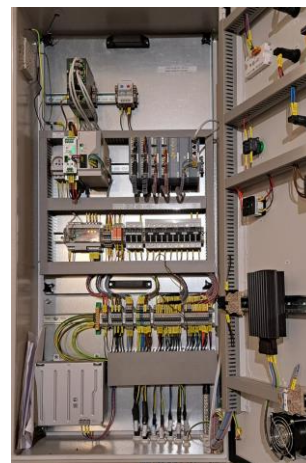
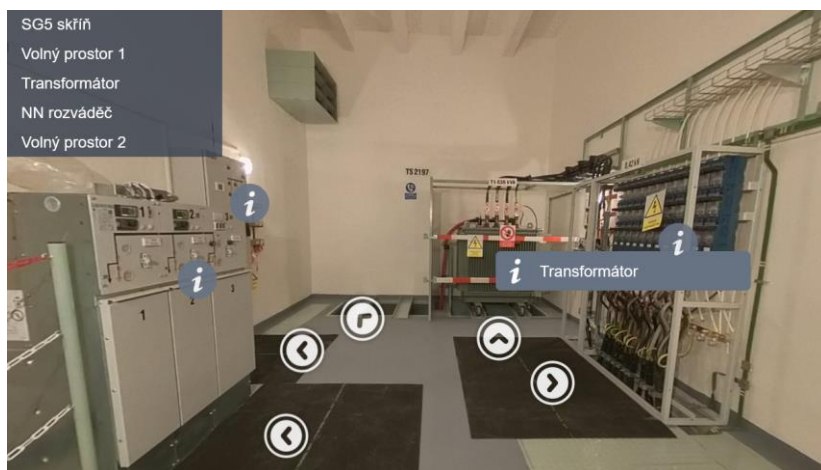


MAIN ACHIEVEMENTS

Currently, about **15% of the substation documentation** has been taken and stored in the application. This information is used for all the use cases defined above. According to PREDistribuce's plan, by the end of 2026, about 50% of the transformer stations should be documented through this solution.

KEY SUCCESS FACTORS

It is absolutely crucial to keep the station documentation up to date. Every time there is a change in the station (e.g., reconstruction, technology replacement etc.), the documentation is deactivated and marked for future updating.



Panoramic view of the transformer station (left) and detailed view of the control cabinet (right).

WAY FORWARD

PREdistribuce is currently working on making the photo documentation available also on a **mobile application**. Further developments are also envisioned in terms of **automatic image processing**. This will allow obtaining additional information, such as measuring distances and device dimensions. For example, in the case of installation of additional technologies, a visit to the station would not be necessary to perform the first assessment steps.