

SUCCESS CASE 32.2025

Mobile Primary Substation

MOBILE PRIMARY SUBSTATION TO IMPROVE NETWORK RESILIENCE



THE CHALLENGE

Enedis operates 2'300 primary substations that supply power to 37.5 million customers across 95% of the French territory. Enedis designs and implements specific solutions to ensure a high level of performance in terms of network resilience and achieve its objective of restoring power to 90% of its customers within 48 hours in the occurrence of high-impact, low-probability events affecting the power network. While repairing incidents on medium voltage (MV), low voltage (LV) lines or on secondary substations is often rapid and can be carried out with local resources, **an incident affecting the equipment of a primary substation** (e.g., faults on transformer bays, the loss of transformer or a global fault affecting the entire substation) **may require complex interventions in terms of materials and logistics, which can take a lot of time.**

THE SOLUTION

To overcome this challenge, Enedis has developed an innovative solution designed to restore power to customers in case of an incident affecting a primary substation. This is **an electrical substation kit, consisting of a set of components, specifically designed to allow transport on trailers and connection in 2-3 days.** This temporary substation replaces the mobile generators put into operation immediately after the incident, and provides a more reliable solution during the period, which can be long, before the definitive repair of the faulty installation.

Enedis first developed a kit called "FIRE Poste Source HTB1" for 63kV/20kV and 90kV/20kV substations and has just completed the development of a "FIRE Poste Source HTB2" kit for 225kV/20kV substations. This project involves partnerships with equipment suppliers (MV modules, automation, HV Bay modules) and a logistics carrier. To accelerate deployment across the entire national territory, Enedis has several kits, stored on two Logistics Platforms, allowing rapid delivery throughout France.

The deployment of the “FIRE Poste Source HTB” is estimated to take a few days, and depends on the impacted infrastructure, the number of modules to be deployed, and the characteristics of the transportation routes.

MAIN ACHIEVEMENTS

The effectiveness of the “FIRE HTB1” kit has already been demonstrated during its deployment following a major incident at the Perros-Guirec substation (Brittany) in March 2022. This kit for restoring the primary substation was deployed in 88 hours. Regarding the new “FIRE HTB2” kit, a first trial was conducted between the end of 2023 and the beginning of 2024 in Picardy (northern France). This successful trial was confirmed in March 2024 with a second trial of the “FIRE HTB2” kit in Ardèche (South of France). These tests allowed verifying the installation capacity of the equipment and adjusting the assembly principles of all components (i.e., adjustment cables, control systems and small equipment).

This innovative solution, initially designed to deal with rare incidents, has also proven to be very useful and effective in facilitating heavy maintenance or renovation operations. It significantly simplified the operation and robustness of the power system during the complete renovation and the installation of a new transformer in the substation in Ardèche where it was tested.



Ad hoc design allowing for transport on trailers and connection in 2-3 days.

For more information about the project, please contact:

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KEY SUCCESS FACTORS

Two success factors have been identified for this solution. The first one is to ensure the ease of implementation, which determines the ability to respond quickly, both in terms of transportation and logistics, as well as installation and commissioning on-site. The second success factor is to ensure that the kit can accommodate as many of the various existing substation configurations in France as possible (rural, urban, underground).