Domloup and La Merlatière
The largest static VAr compensators in France

Alstom strengthens the transmission system of French utility, Réseau de Transport d’Electricité, with its patented static VAr compensator configuration.

TECHNOLOGY
Alstom patented Static VAr compensator configuration with blocking reactor

BENEFITS
• Improved harmonic performance
• Loss and noise optimisation
• Optimisation of thyristor quantity and rated current at TCR reactors level

COUNTRY: France
PROJECT: Domloup and La Merlatière
CUSTOMER: Réseau de Transport d’Electricité
SCOPE: Alstom patented Static VAr Compensator configuration with blocking reactor
RATING: ±250 MVAR at 225 kV
COMMERCIAL OPERATION: 2013

THE SITUATION
The Brittany and Vendée regions in France boast breathtaking landscapes and beautiful coastlines. At times, however, these regions are susceptible to electricity outages during peak demands.

In 2011, the French utility, Réseau de Transport d’Electricité (RTE), decided to address this issue by installing in these regions two large Static VAr Compensators (SVC) of ±250 MVAR each, the highest rated power ever installed in France.

La Merlatière in Vendée, and Domloup in Brittany, were the two sites selected for the SVC installations.

As the main objective was to strengthen and enhance the French network stability and quality in case of high ranges in voltage variation, one criteria was that the SVCs would ensure a high level of availability and performance. In this case, the SVCs would help maintain the network voltage with regards to the electrical load variation by absorbing or supplying the necessary reactive power within few tens of milliseconds.
ALSTOM’S SOLUTION

Responding to RTE’s inquiry, Alstom proposed its patented SVC configuration. This configuration is composed of a blocking reactor, a Thyristor Controlled Reactor (TCR), a fifth harmonic filter and a Mechanically Switched Equipment (MSE). The MSE is further comprised of a Mechanically Switched Reactor (MSR) and a Mechanical Switched Capacitor (MSC).

The main advantages of the proposed Alstom patented SVC configuration are:

- Improvement of harmonic performance
- Optimisation of thyristor quantity and rated current at TCR reactors level
- Loss optimisation
- Noise optimisation

Alstom’s fully automatic control system, meanwhile, monitors the network voltage and automatically adjusts the reactive power according to user demands.

PROJECT EXECUTION

The Alstom project management team based in France collaborated closely with the customer. The main SVC equipment were fully designed by Alstom units in Finland and France.

One of the contractual requirements was the maximum noise level at the SVC boundary. In accordance with the results of a detailed noise study, adequate noise enclosures were placed on the reactors and efficient acoustic barriers were installed at suitable locations to minimise the environmental noise impact of the SVC.

The construction of these turnkey projects began only eight months after the contract award, following the conceptual engineering studies, to comply with the twenty-four month contractual schedule. The heat run and performance tests were successfully achieved in October 2013 at the satisfaction of the customer, finalising and validating the commissioning.