

SVC for voltage stabilization and harmonic suppression in rolling mill

Since 1985, G.T.S Industries – site SOLLAC Dunkerque, France is operating a Static Var Compensator (SVC) delivered by ABB. The SVC, which has a dynamic (thyristor controlled) range of 66 Mvar capacitive is connected to a 90 kV rolling mill bus. Its purpose is to stabilize the bus voltage under varying load conditions which occur during the running of the mill.

This SVC also comprises harmonic filters tuned to the 5th and 7th harmonics in order to suppress harmonic generated by the thyristor converters in the rolling mill, thereby preventing these harmonics from entering into the surrounding parts of the network.

Furthermore, it achieves power factor correction of the rolling mill, thereby relieving the network of reactive power burden and contributing to a considerable decrease of the running costs of the mill.

(A saving of about 3 million francs a year on the power billing in 1986 currency).

Besides being a source of harmonics, a rolling mill as a load on the network is generally characterized by high and fluctuating consumption of reactive as well as active power. As a consequence, the rolling mill will give rise to voltage fluctuations in the feeding network, the severity of which being dependent on the relationship between the size of the rolling mill and the strength of the network.

At the same time, for safe operation, the thyristor converters which form part of the rolling mill can only tolerate limited fluctuations in the supply voltage. Consequently, the voltage fluctuations, if severe enough, may endanger the reliable operation of the rolling mill, as well as cause nuisance to other equipment connected to the same network.

In the present case it was decided to invest in the SVC in order to attain dynamic bus voltage stabilization and harmonic suppression, thereby improving the performance of the Mill itself and at the same time fulfil existing obligations towards the grid company by keeping the quality of the voltage at the point of common coupling (220 kV) within specified limits.

The maximizing of useful active power transfer while minimizing system losses was also seen as a valuable feature.

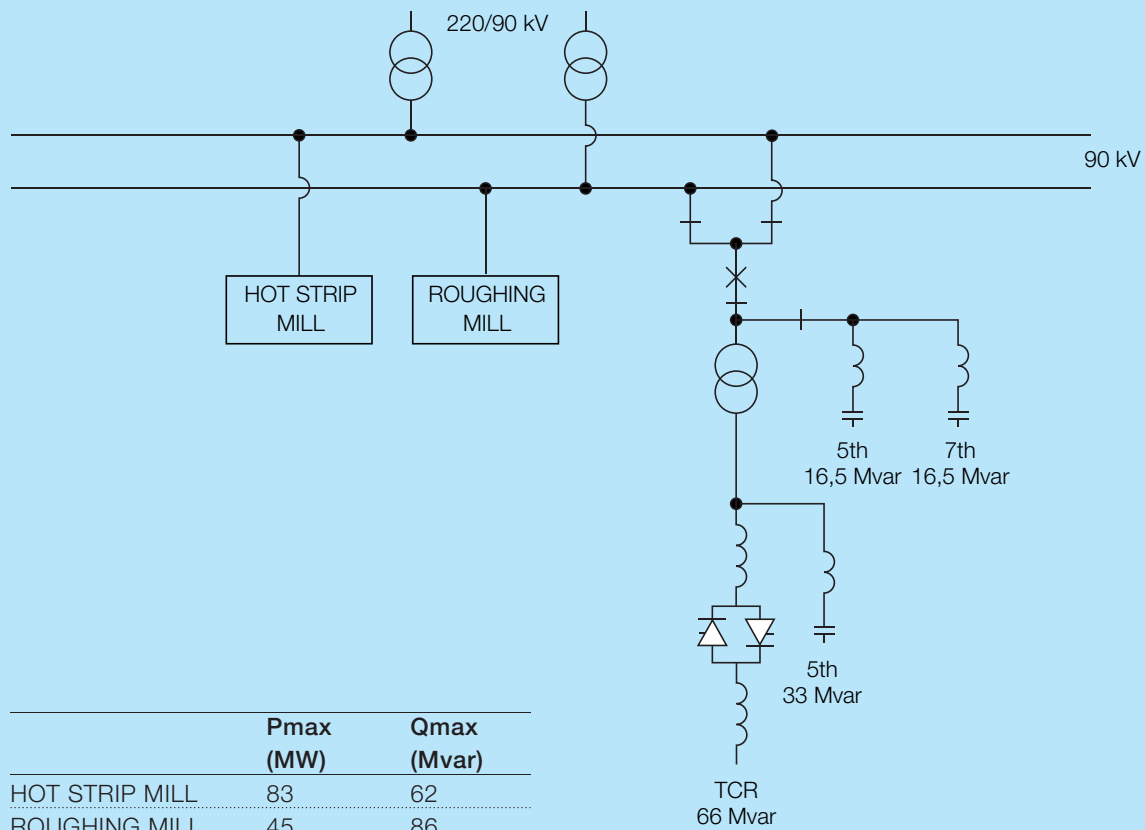


The SVC ensures that the following requirements on voltage control and harmonic filtering are satisfied:

- Maximum 90 kV (feeding network)
 - bus voltage variations 5 %
- Odd harmonics max 1 %
- Even harmonics max 0.6 %
- Total distortion max 1.6 %

Technical data SVC

Controlled voltage	90 kV
Dynamic range	0-66 Mvar (capacitive)
Harmonic filters	33 Mvar/5th 16,5 Mvar/5th 16,5 Mvar/7th
Control system	3-phase symmetrical closed-loop reactive power control
Thyristor valves	Air cooled thyristor valves with magnetic triggering



Single-line diagram

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