Since 1991, Tenaga Nasional Berhad of Malaysia (TNB) operates three Static Var Compensators (SVC) supplied by ABB in its 275 kV power transmission network. The compensators, comprising two units at the Kuala Lumpur North substation and one unit at the Yong Peng North substation further to the south, have each a dynamic rating of 100 Mvar inductive to 100 Mvar capacitive at 275 kV.

The purpose of the SVCs is to provide voltage control during daily load cycles as well as to act as dynamic reactive power reserves in the event of major network disturbances, such as loss of generation and/or loss of transmission. Provisions for damping of active power oscillations are also included.

Furthermore, a number of mechanically switched shunt reactors (MSR) at Kuala Lumpur North and Yong Peng North are controlled from the SVCs.

Each compensator consists of two Thyristor-Controlled Reactors (TCR), each rated at 57.5 Mvar, two Thyristor-Switched Capacitors (TSC) rated each at 42.5 Mvar and two Harmonic Filters for harmonic suppression with a joint rating of 15 Mvar. The overall dynamic range as seen from the 275 kV side thus goes from 100 Mvar inductive to 100 Mvar capacitive.

The SVC control system is of a closed-loop voltage control type. To ensure optimum dynamic response for various network conditions, automatic gain supervision and optimizing is included in the regulator of each SVC.

In case of undervoltage, for example caused by short circuits in the surrounding network, action is initiated by the voltage regulator wherein the SVC is controlled to zero output and then automatically goes back to normal voltage control upon return of the voltage. This function will effectively reduce system disturbances on such occasions.

In order to achieve the greatest amount of flexibility of operation, the two compensators at Kuala Lumpur North can work either independently or under joint control mode.
The SVC at Yong Peng North is furthermore provided with a slow-acting current regulator which can be activated by the operator. This function keeps the compensator output within set limits, thereby ensuring that there will be sufficient reactive power available in case of network contingency situations.

**Technical data**

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Station layout (Kuala Lumpur North)

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