

STATCOM Control for Power Transmission System Stabilisation

ENGINEERING EDUCATION TECHNICAL DIVISION



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A talk on STATCOM Control for Power Transmission System Stabilisation by Dr Stella Morris was conducted on 10 February 2011. The talk, attended by 30 participants, was organised by the Engineering Education Technical Division.

Electrical energy consumption per year is increasing in tandem with the increase in demand year-on-year. This necessitates new development in efficient electricity system management in the form of combined cycle power stations, renewable energies, green energies, *etc.* One of the main components in the electrical system is the transmission line. As the development of new transmission lines is increasing, several issues such as limited resources and environmental restrictions have become major stumbling blocks. A promising solution called FACTS (Flexible AC Transmission System) was introduced to overcome these problems.

FACTS is an AC transmission system which consists of static and power electronics based controllers. It focuses mainly on controllability and power transfer capability. The most important element in FACTS is the thyristors – small, high voltage, semiconductor-based devices that permit the control and switching of very high power transmission within milli- or micro-seconds. FACTS devices can be fitted into different applications such as Static VAR Compensator (SVC), Static Synchronous Compensator (STATCOM), Thyristor Controlled Series Capacitor (TCSC) and Unified Power Flow Controller (UPFC).

STATCOM is a shunt controller that injects current and controls the voltage with reactive power compensation, where it supplies almost a constant reactive power. STATCOM is designed with self commutated converter technology, which offers rapid response to system events. STATCOM has the capability to provide reactive power, thus protecting the system from potential threats of voltage collapse.

Dr Morris emphasised on the use of STATCOM in improving the dynamic performance and transient stability of power systems as well as minimising the adverse impacts of power system stabilisers (PSS). She also presented a few simulation results for STATCOM using Neuro Sliding Mode Controller as well as Fuzzy and Artificial Neural Network based controller, for both single and multi machine power systems. The simulation results showed that a system using STATCOM produces good and stable results for every simulation. This shows that the STATCOM controller is a viable solution to address system stability issues for power transmission systems. ■

Answer for 1Sudoku published on page 18 of this issue.

6	3	7	9	8	2	1	5	4
1	5	9	4	7	6	8	2	3
4	8	2	1	3	5	7	9	6
5	1	8	2	4	9	6	3	7
9	4	6	7	1	3	2	8	5
2	7	3	6	5	8	4	1	9
8	6	1	5	9	7	3	4	2
3	2	5	8	6	4	9	7	1
7	9	4	3	2	1	5	6	8

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