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# INNOVATIVE WORK TECHNOLOGIES USED IN THE ELECTRICAL ENERGY SYSTEM

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**Abstract**

Reliable control of the world electric power system is implemented by innovative electrical devices and technologies. Among such modern technologies, it is possible to include FACTS-Flexible Alternative Current Transmission System devices.

**Keywords**

FACTS, power system, SSSC, TCSC, SVC, STATCOM, UPFC, IPFC.

It is advisable to use FACTS-Flexible Alternative Current Transmission System (FACTS-Flexible Alternative Current Transmission System). In addition, the task of the FACTS family of devices to improve the management of power flows in the electric power system is considered important. Therefore, the problems of improving and expanding the energy market between the neighboring countries, which currently work in parallel with the electric power system of Uzbekistan, will also find their solution. Currently, the Central Asian United Energy System (BET) is working on the aforementioned issues. Such technologies are effective for both large and small power systems. In addition, the role of FACTS technology is incomparable to solve the problems that arise in providing consumers with reliable and high-quality electricity supply.

FACTS technology is a family of devices, each of which can be used individually or in combination with other devices to control the interrelated parameters of the electric power system. The purpose of FACTS technology is to improve the stable control of power flows in electric power systems. In general, FACTS technology allows taking various corrective actions depending on the conditions of a specific control task and is divided into several types.

FACTS devices perform the following tasks: power flow control, emergency current limiting, voltage adjustment and control, load balancing, increasing the dynamic stability limit, limiting temporary overvoltages, compensating reactive

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power, increasing the carrying capacity of the EUL line, damping various fluctuations in EET and others.

Thus, SVC, STATCOM and TCSC are used to comply with voltage limits, TCSC, SSSC and UPFC are used for thermal limits, and TCSC, SSSC are used to increase stability. UPFC type is a high performance FACTS device for active and reactive power control, line power conversion, line voltage control in transmission lines.

**The following types of FACTS devices are used:**

**SSSC (Static Synchronous Series Compensator)**- Longitudinal static synchronous compensator;

**TCSC (Thyristor Controlled Series Capacitor) -** thyristor controlled longitudinal capacitor;

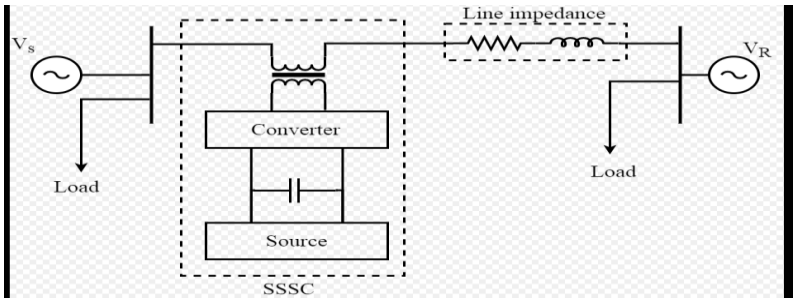
**SVC(Static Var Compensator)-** Static reactive power compensator;

**STATCOM(Static Synchronous Compensator)-** Static synchronous compensator;

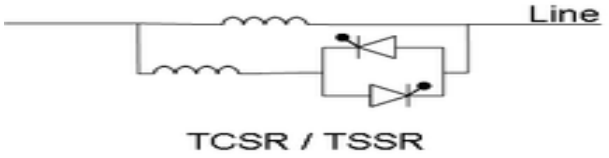
**UPFC (Unified Power Flow Controller)-** Unified power flow controller;

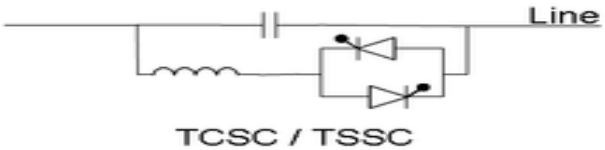
**IPFC (Interline Power Flow Controller)-** Interline power flow controller.

**Let's look at some of the FACTS family of technologies in connection schemes:**




1) SSSC (Static Synchronous Series Compensator) - Longitudinal Static Synchronous Compensator




2) TCSC (Thyristor Controlled Series Capacitor)

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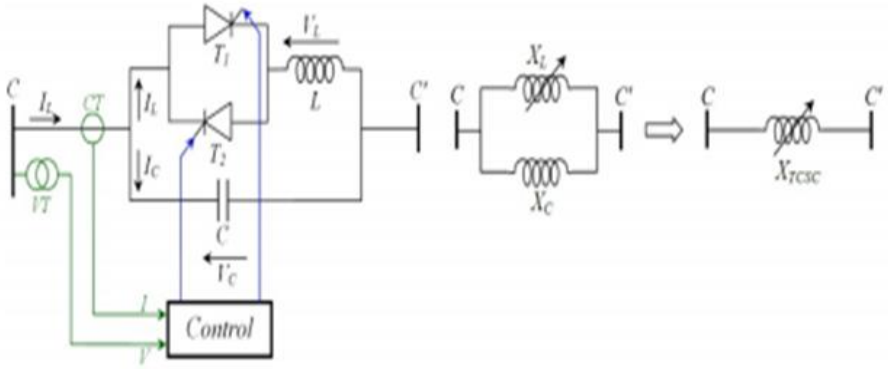
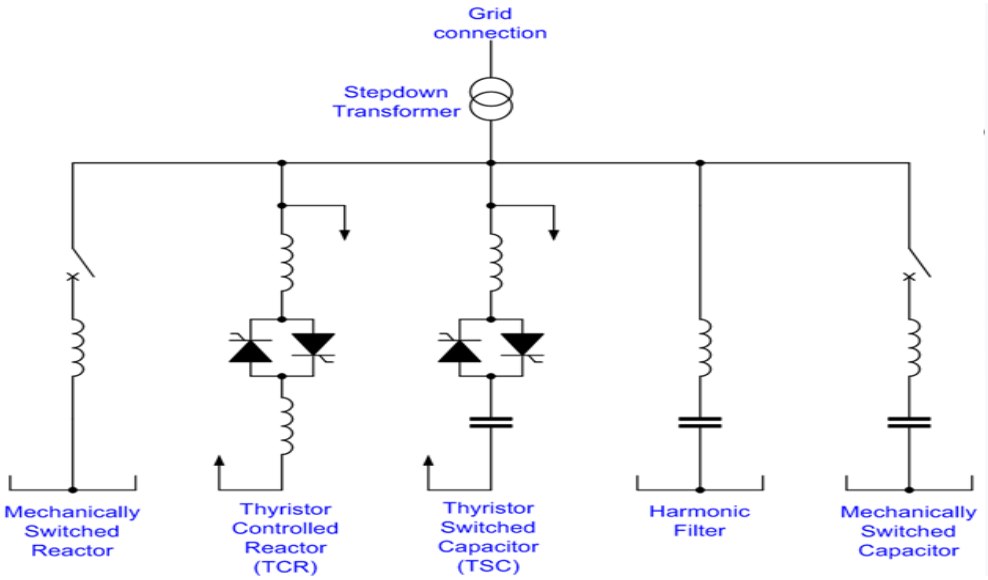
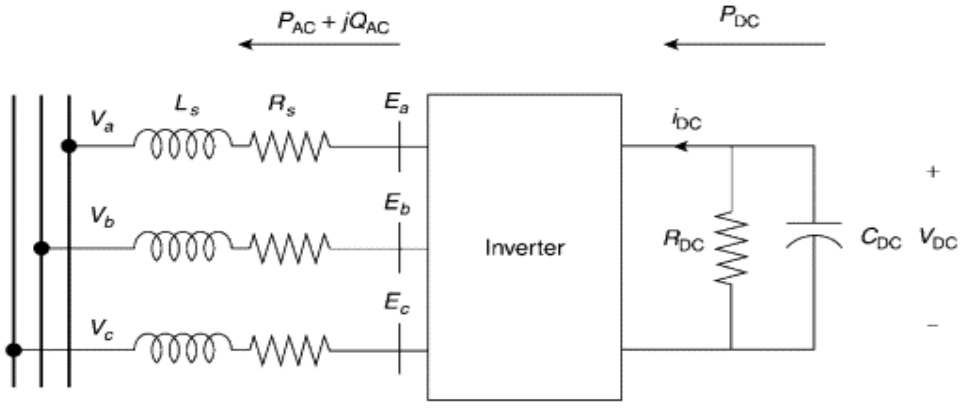



3)SVC(*Static Var Compensator*)




4)STATCOM(*Static Synchronous Compensator*)




5)UPFC(*Unified Power Flow Controller*)

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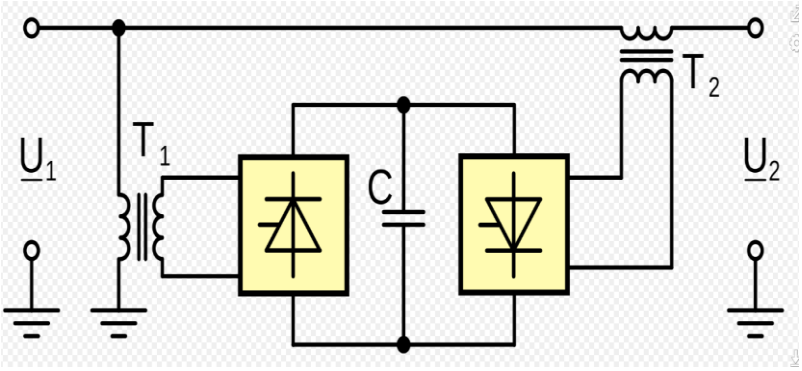
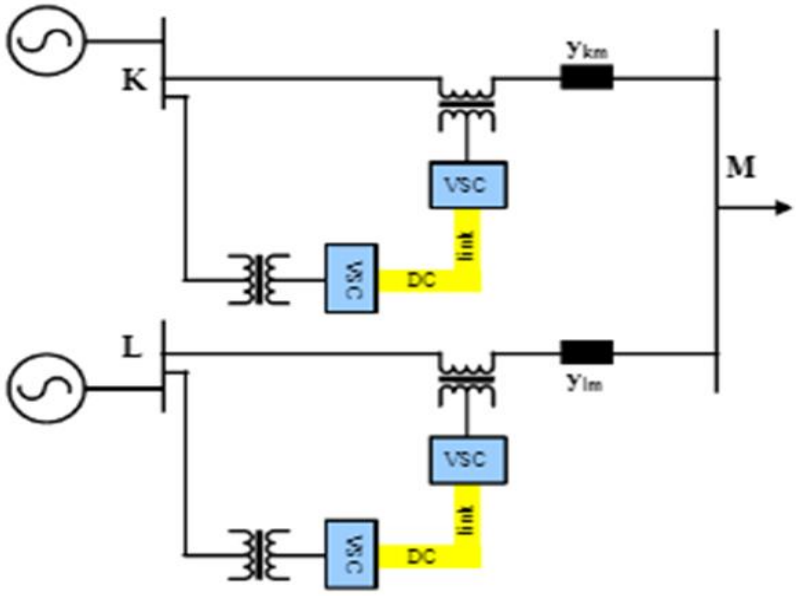
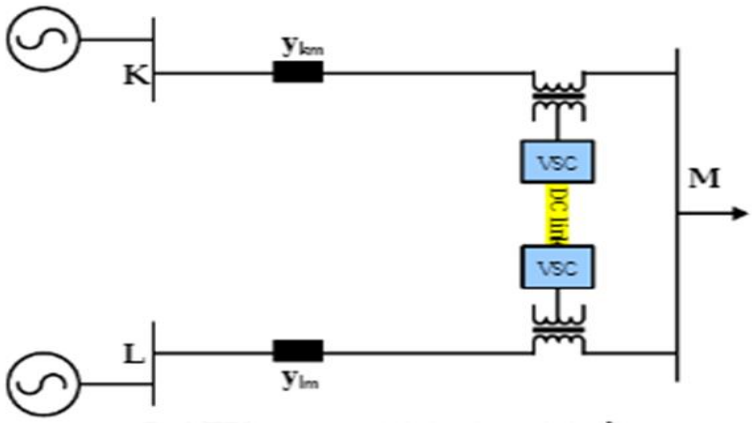



6)IPFC (*Interline Power Flow Controller)*

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