Possibilities of power flows control in electric power systems with use FACTS Devices

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Outline

• Actual tendencies
• FACTS
• Simulation Model
• Control of power flow
• CONCLUSION
The actual tendencies of the electric power systems operation have the following character:

• Increasing capacities of the electric energy
• Increasing operating utilization of the transmission elements
• Increasing differences between physical and business electric energy flows
• Detect networks bottlenecks
What is FACTS?

• Flexible Alternating Current Transmission System
• These devices have been developed by Electrical Power Research Institute (EPRI) in the 80s
• FACTS devices are used to optimize already the existing transmission lines
FACTS devices are:

- **Serial Controllers**: Static Synchronous Series Compensator SSSC, Interline Power Flow Controller IPFC, Thyristor Controlled Capacitor TCSC, etc.

- **Parallel Controllers**: Static Synchronous Compensator STATCOM, Static Synchronous Generator SSG, Static Var Compensator SVC, etc.

- **Serial - serial controllers**:

- **Series - parallel controllers**: Unified Power Flow Controller UPFC, Unified Controller Phase Shifting Transformer TCPST, Interphase Power Controller IPC, etc.
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Power System of The Slovak Republic
Active power
Control of power flow with TCSC
Control of power flow with UPFC
Control of voltage with UPFC
Transient stability
Transient stability
CONCLUSION

- UPFC belongs to the most integrated devices of the FACTS devices group.
- It is possible to use these devices for the control flows of active and reactive power.
- FACTS devices contribute to improve of the limits of static, transient stability and voltage quality.
Thank you for your Attention