Possibilities of power flows control in elecktric 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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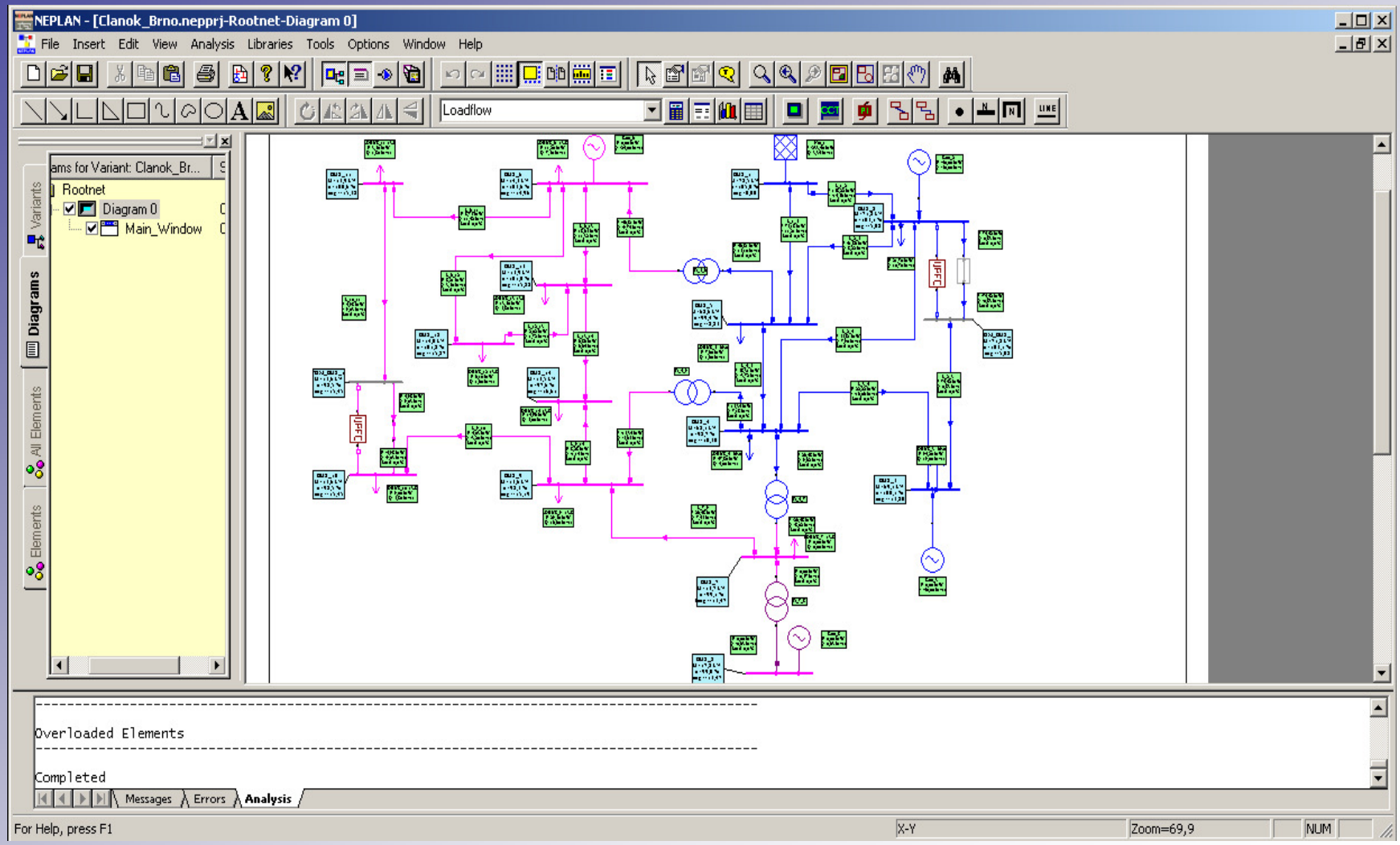
Software


NEPLAN - [Clanok_Brno.nepprj-Rootnet-Diagram 0]
File Insert Edit View Analysis Libraries Tools Options Window Help
Loadflow
Rootnet
Diagram 0
Main_Window
Variants
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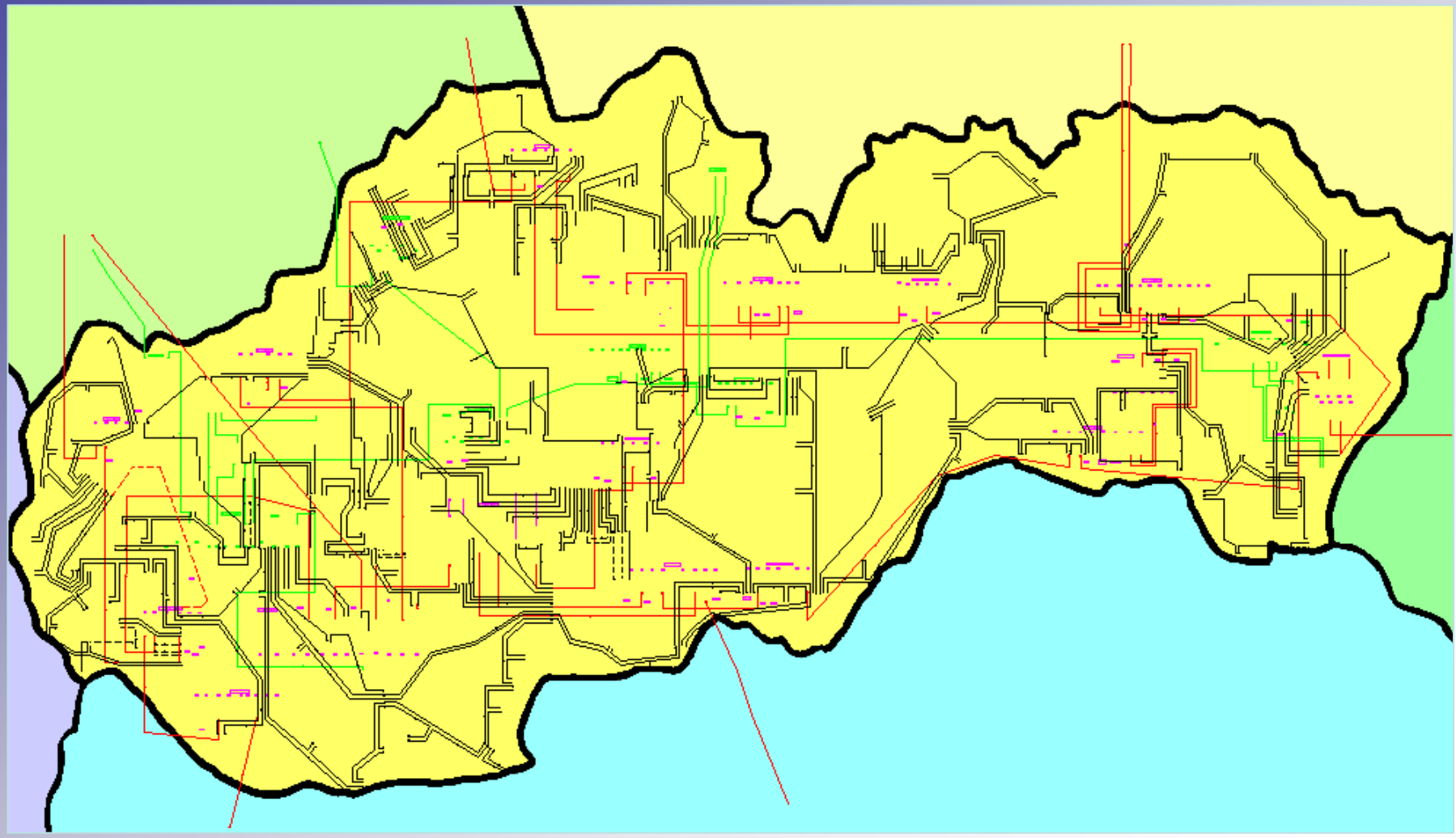
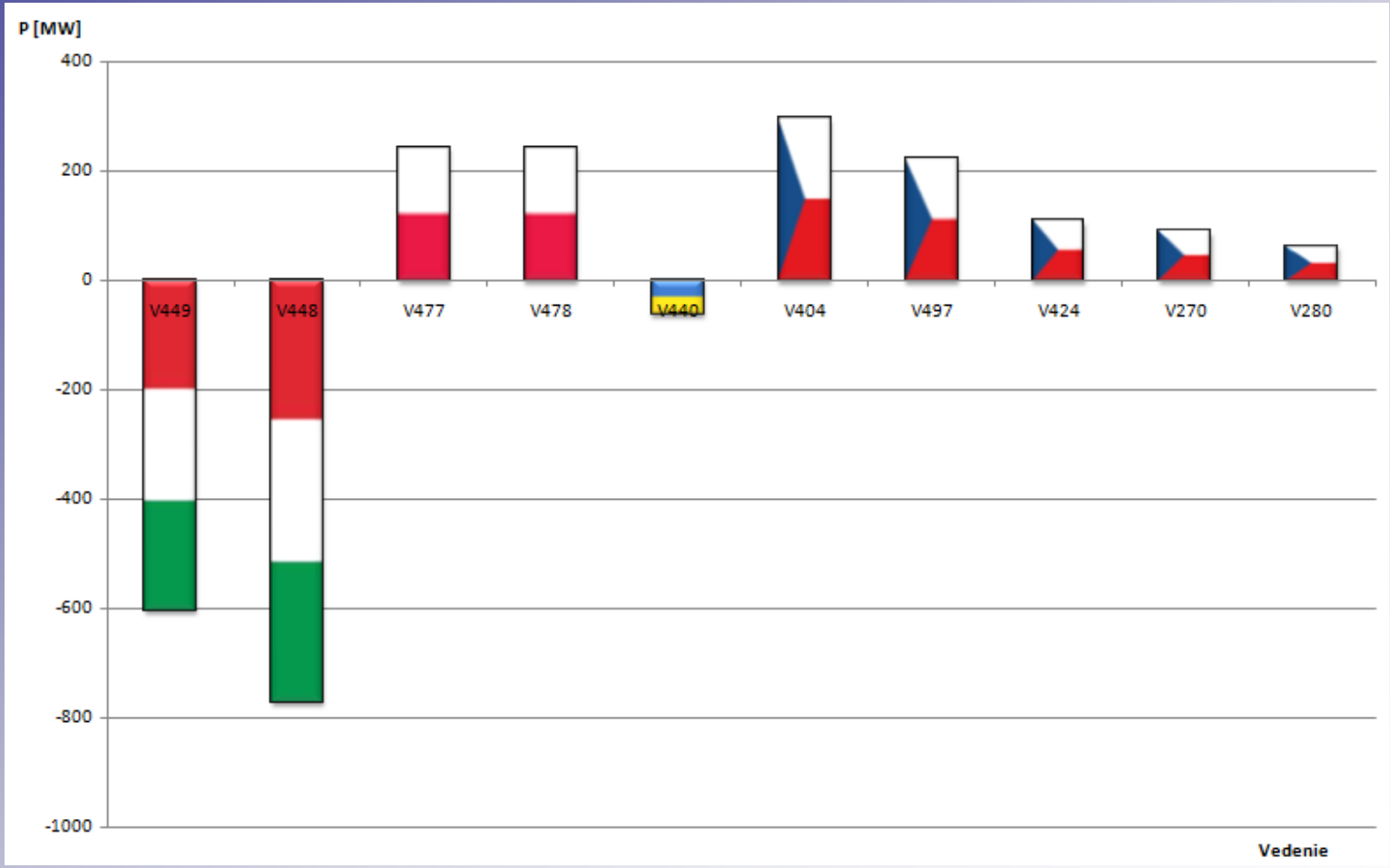
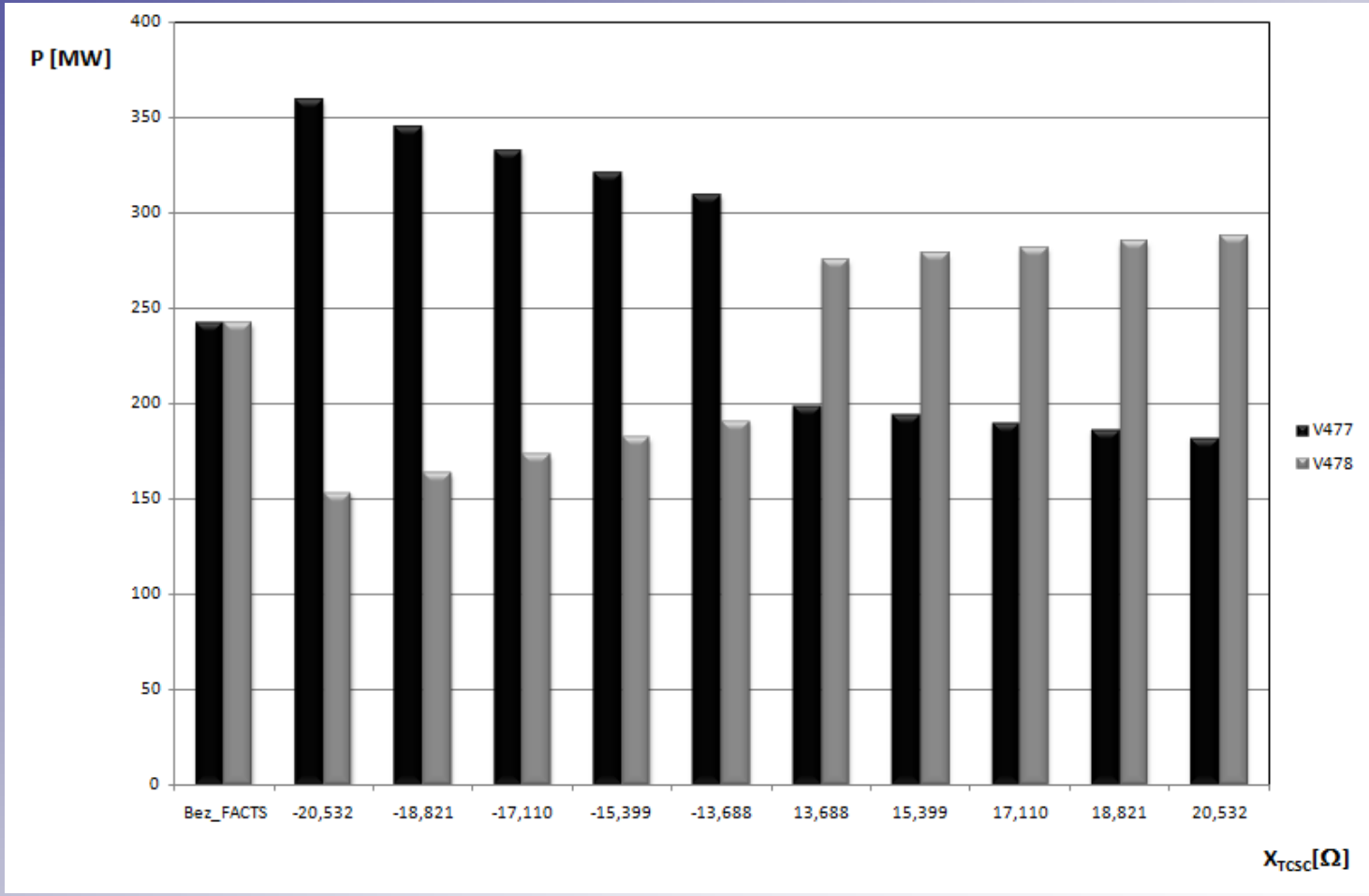
Power System of The Slovak Republic



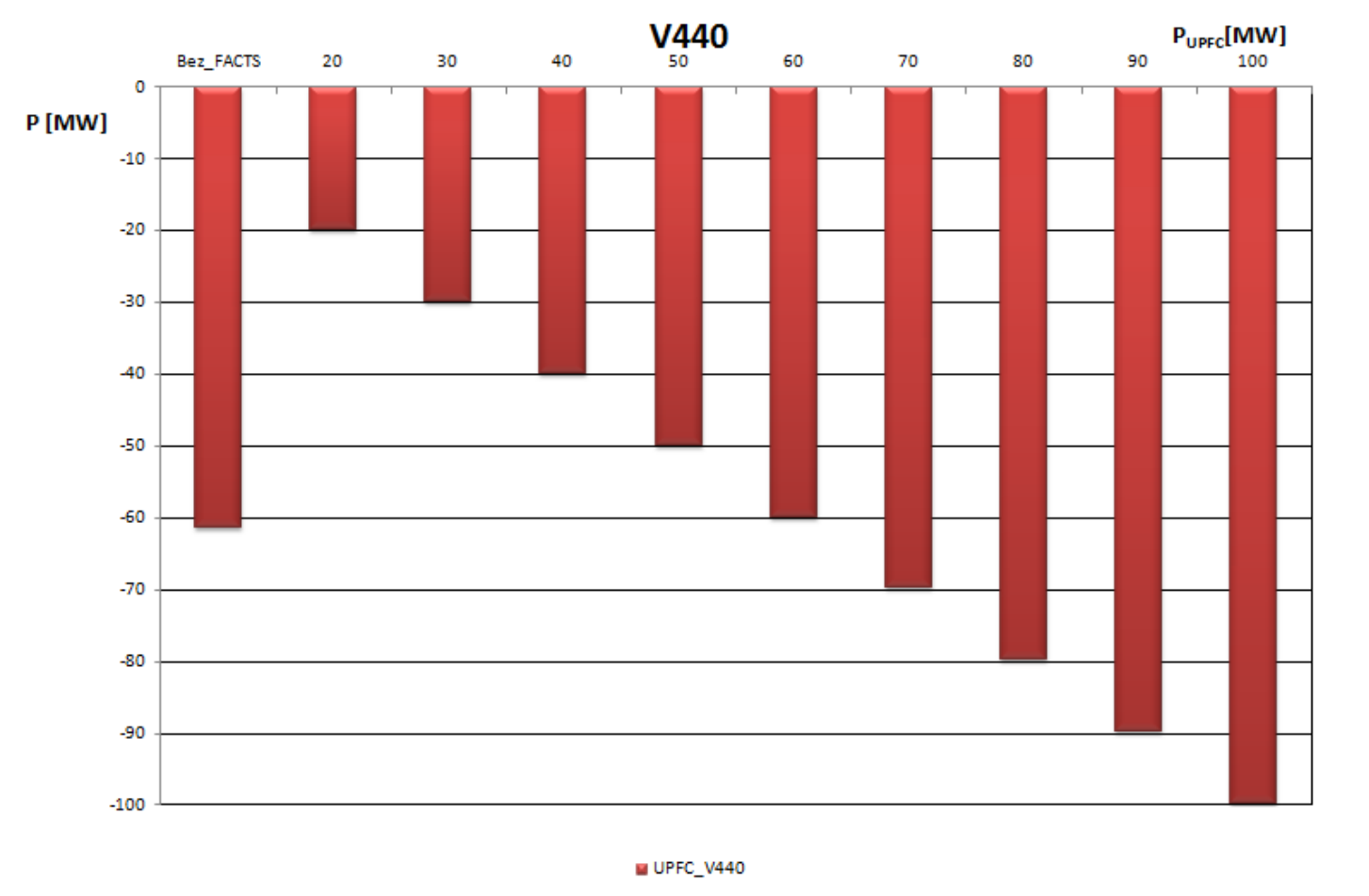
Active power



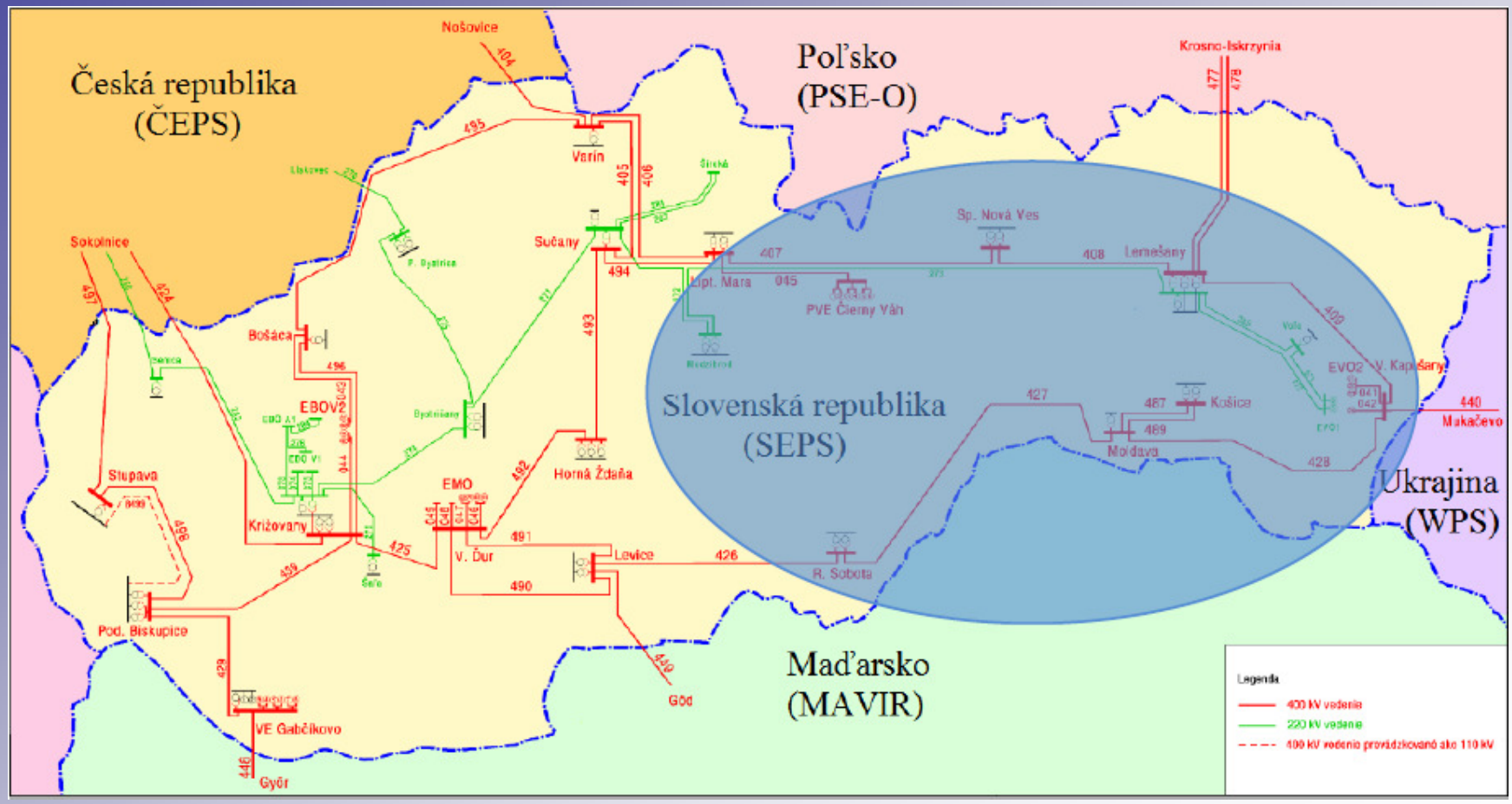
Control of power flow with TCSC



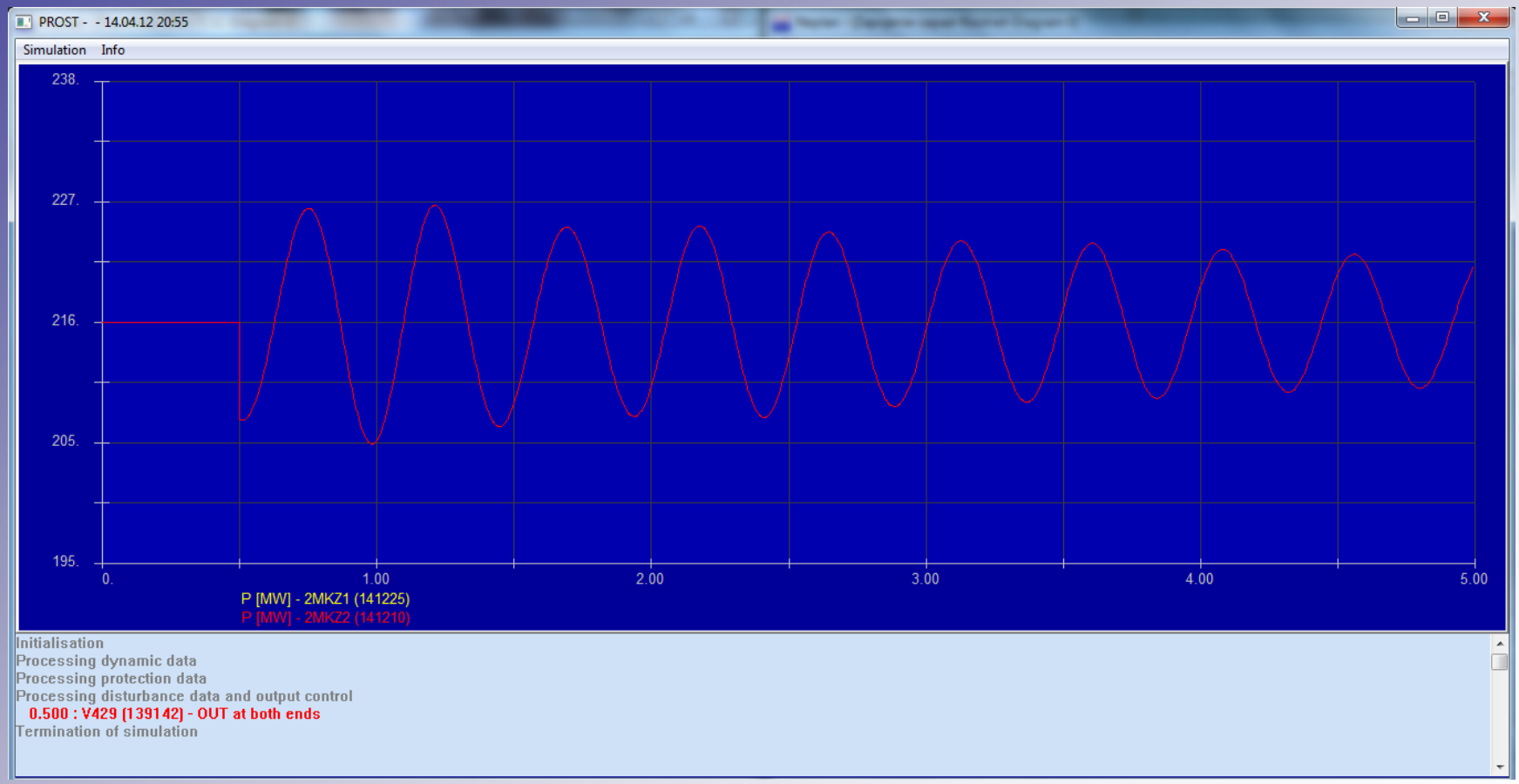
Control of power flow with UPFC



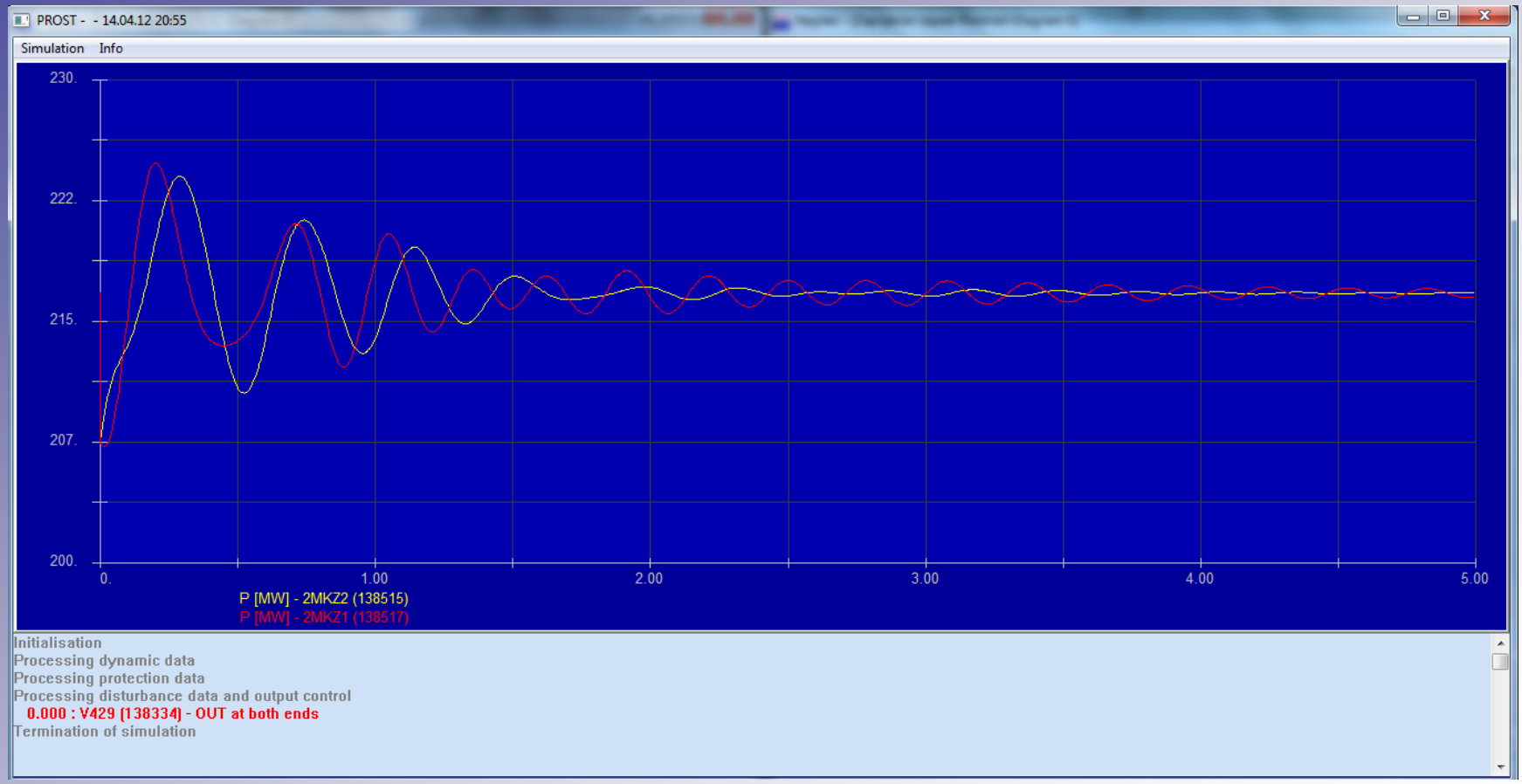
Control of voltage with UPFC



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