Paris Session 2022

M-SSSC Novel Applications Worldwide

B4 DC Systems and Power Electronics

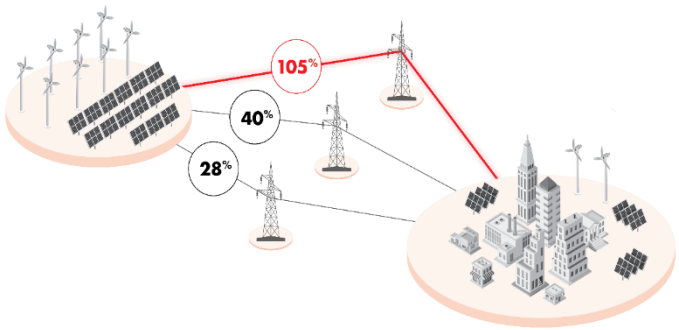
PS3-2 – Other Power Electronics Applications

Q3.2 Congestion Management and other Applications for M-SSSC

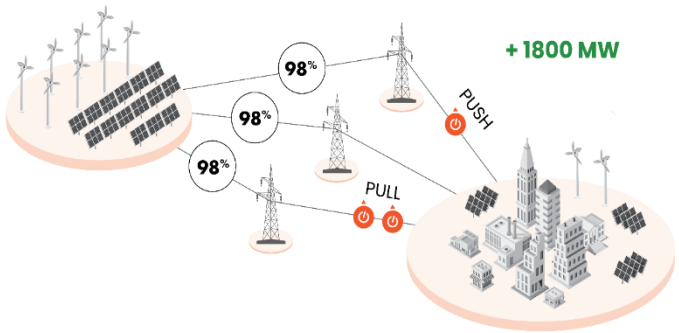
Mario Patino, Colombia

Modular Static Synchronous Series Compensator

Congestion Scenarios



Power Flow Control with M-SSSC



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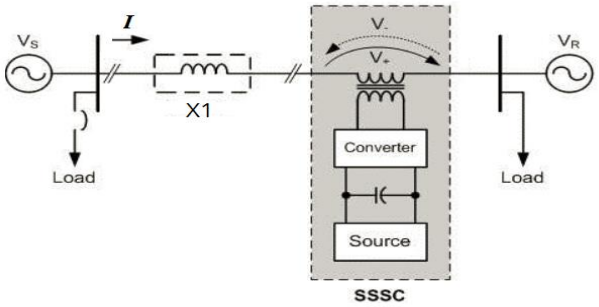
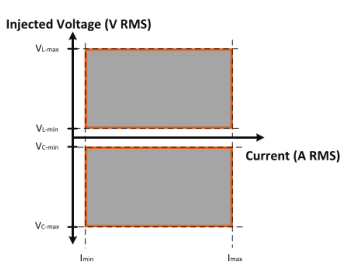
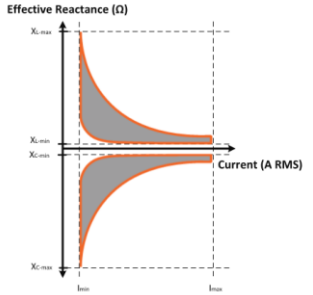
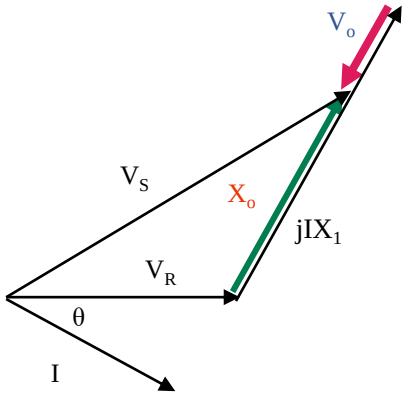
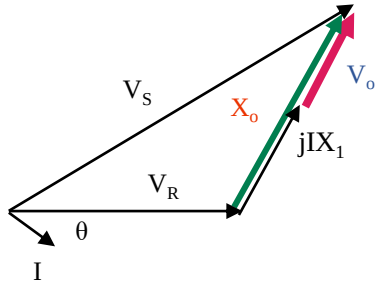








Capacitive Compensation

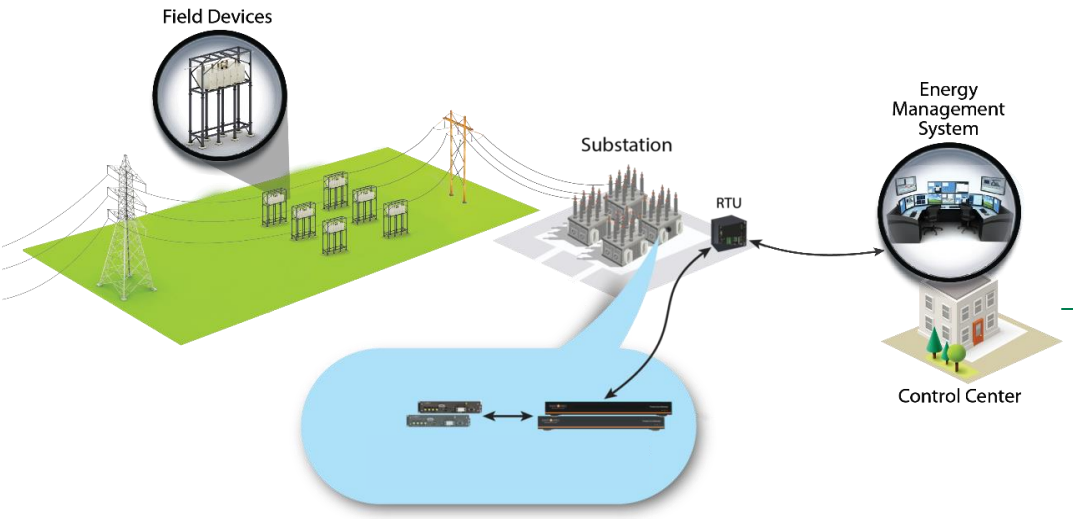


Inductive Compensation

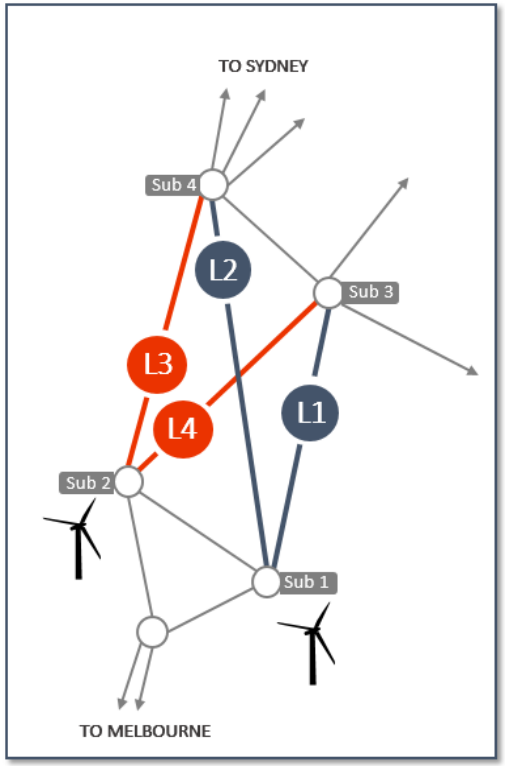
$$P = \frac{V_S V_R}{X_{eff}} . \sin(\delta_1 - \delta_2)$$

$$Q = \frac{V_S V_R}{X_{eff}} \left\{ cos(\delta_1 - \delta_2) - \frac{V_S}{V_R} \right\}$$

M-SSSC Interoperability and Real-Time Applications



- **Real-Time Congestion Management** (Dispatchable Lines)
- **Symbiotic operation with:**
  - EMS Tools
  - Dynamic Line Rating
  - Topology Control
  - BESS
  - WAMPAC



M-SSSC Advanced Global Applications

- **Series Compensation Without SSR Risks**
- Voltage Control Support
- Passive damping of slow-frequency inter-area oscillations
- M-SSSC + LCC-HVDC Case Studies
  - SCR support
  - Reduce filter size and improve footprint
  - Avoid ferroresonance risks with DC transformers
  - Help avoid commutation failures