Power system operation and control – R & D challenges in the future

SvK focus areas

- Increased utilization of the grid
- Robustness and increased reliability
- Improved tools and support systems for controlling the power system
- Development of technics, which gives less impact on the environment
- Optimisation of grid maintenance
- Development of the electricity market

Increased utilization of the grid

- Overload capability
- Powerelectronics for AC-power control
- AMS – Live line working
- Systemprotection
  - Increased capacity
  - Improved reliability (n ≥ 2)

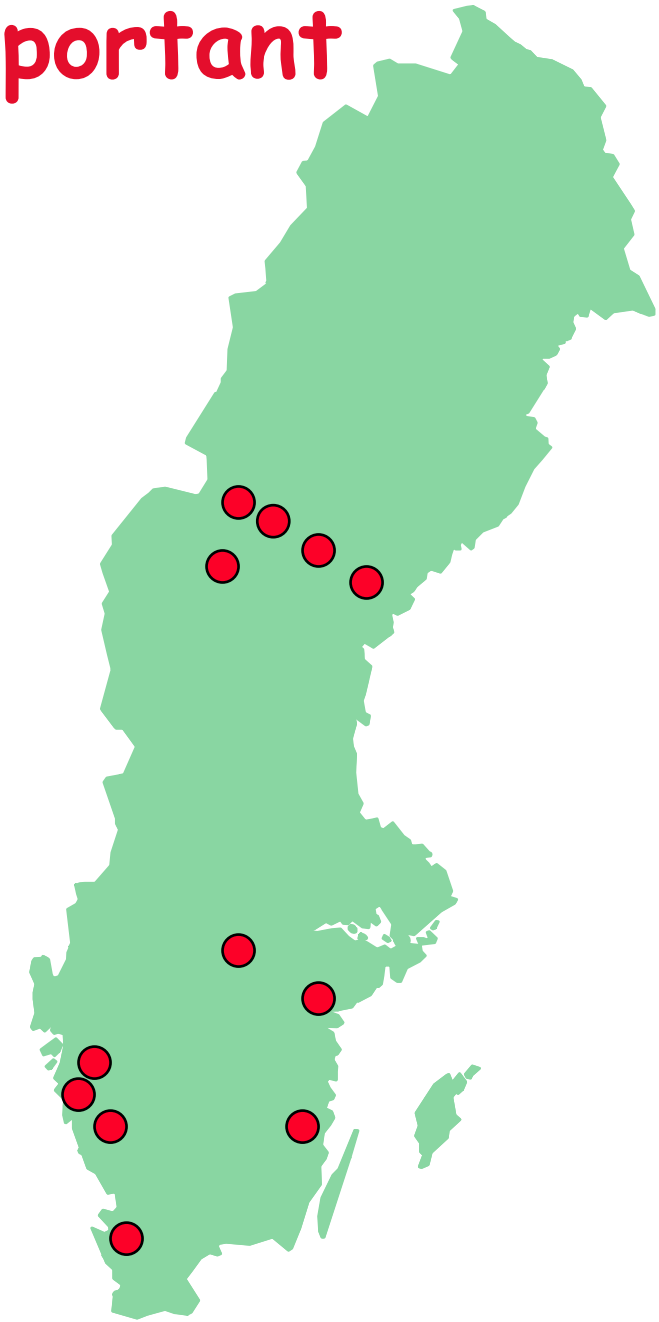
Robustness and increased reliability

- New switchgear design
- Improved monitoring of the power system
- Impact of distributed generation in the power system
- Risk management

Reconstruction of important substations

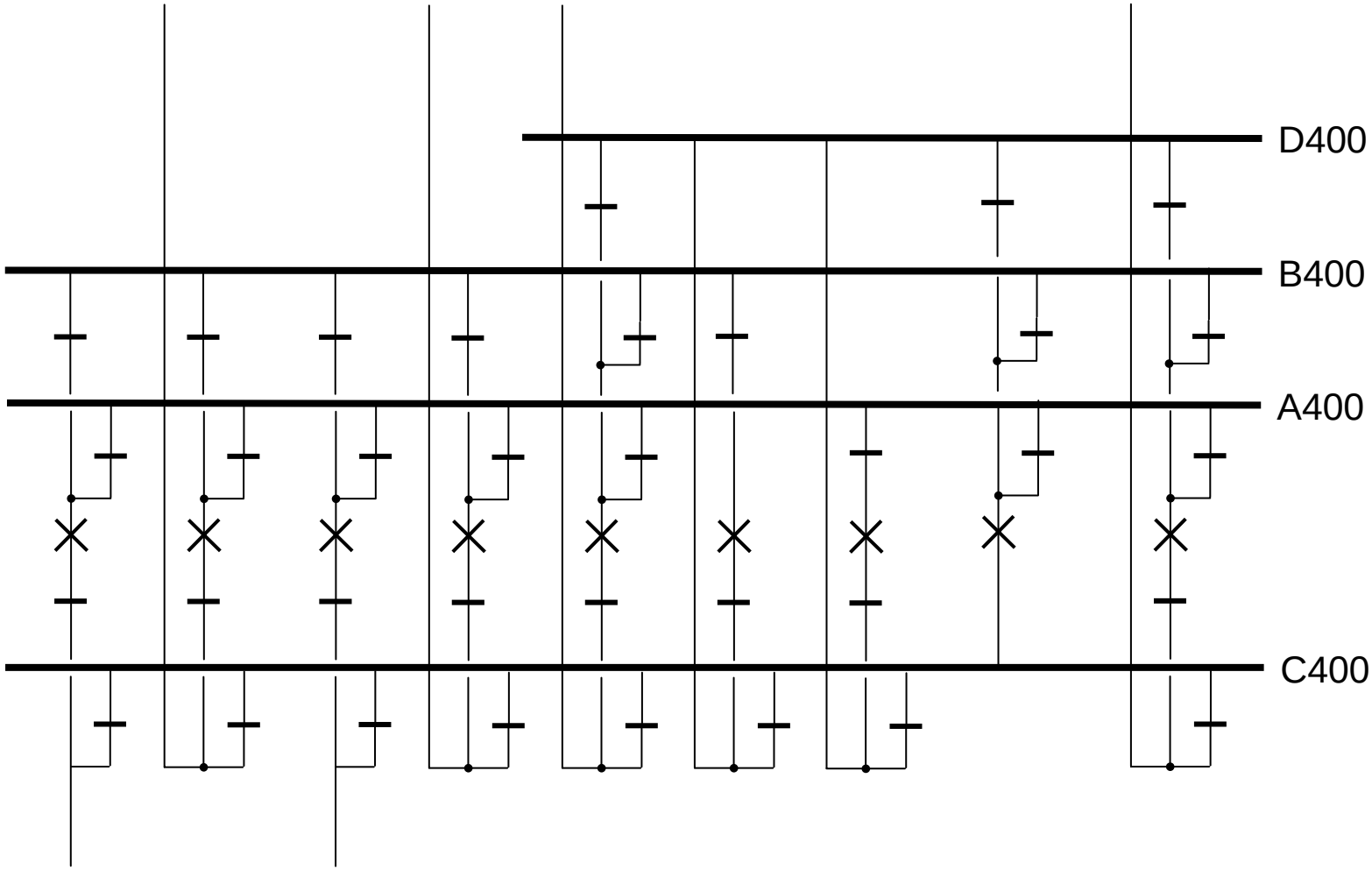
Two per year
(Each 75 – 100 Mkr)

- Stenkullen
- Långbjörn
- Horred
- Hjälta
- Söderåsen
- Storfinnforsen
- Hallsberg
- Ramsele
- Simpevarp
- Midskog
- Strömma
- Kimstad



Svenska Kraftnät

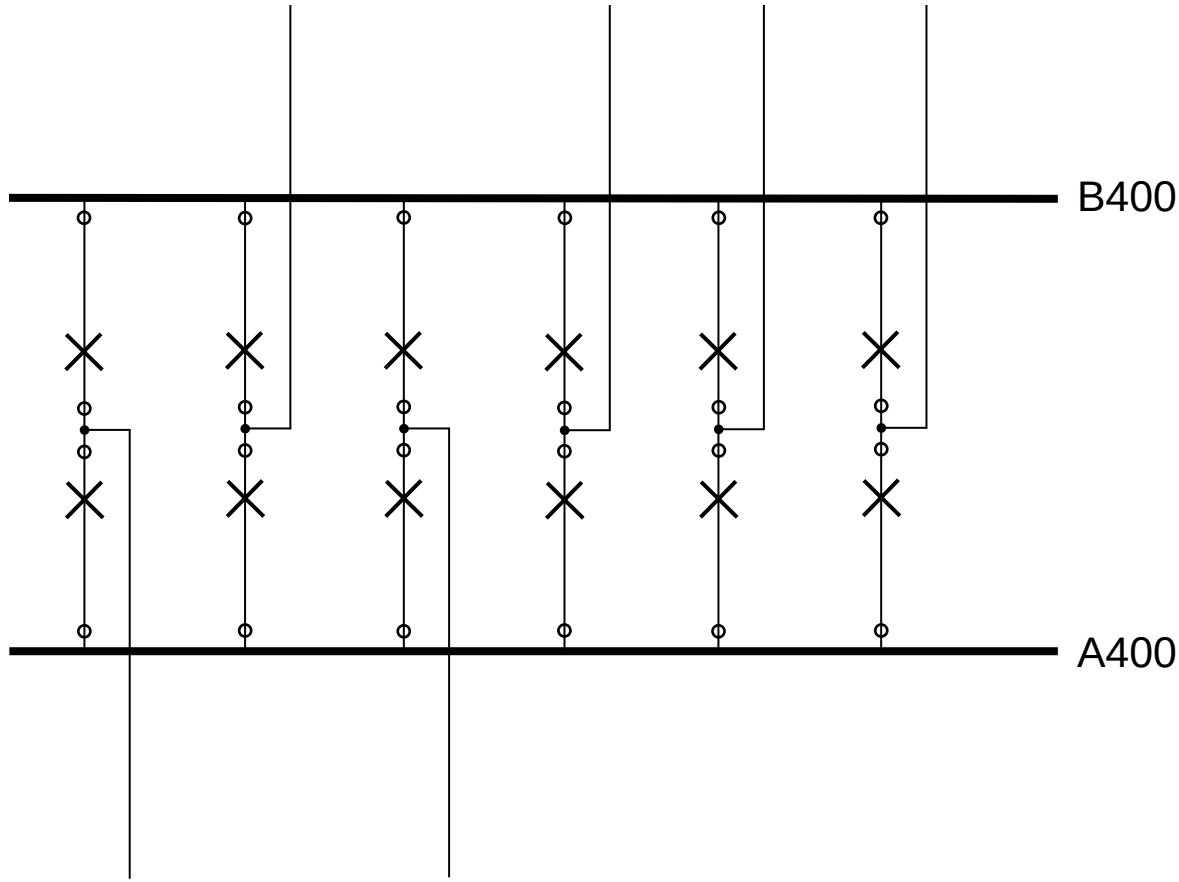
400 kV switchgear from 1970 - 1985



Svenska Kraftnät

400 kV two breaker configuration
with combined breaker an disconnector

No disconnectors
No incomming OHL passing more than one busbar



Svenska Kraftnät

Improved tools and support systems for controlling the powersystem

- Alarm handling
- Supporting expert systems
  - Early warning
  - Real time stability monitoring
  - Security analysis
- Forecasting

Development of technics, which gives less impact on the environment

- Dry technics
- 220 kV ang 400 kV compact transition from OHL to cable
- Compact solution and special design OHL

Optimisation of grid maintenance

- Real time monitoring
- Aging issues
- RCM

Development of the electricity market

- Paking capacity
- Price elasticity