Nordic Workshop in Power System Protection and Control

Digital enablers, a new dimension to protection philosophy?

VAASA - UVA
Energy sector industry in Finland, Vaasa area

Why high level education is important

- Over 90% of Finnish electricity system automation related R&D located in Vaasa region
- 100% of countries on earth has technology in electricity system developed in Vaasa
- Over 140 companies
- Business turnover 4.4B€, export rate over 80%
- 30% of Finland’s total export in energy technologies
- 25% of total manpower in the field of energy in Finland
Going digital
Keep going

Digitalization changed our everyday life
- Indeed

Digitalization changed industry
- Industry 4.0

Are we in the same speed?
- Energy revolution
- What today’s technology has to offer to us?
**Protection relays**

Digital journey 80’ - xx

- Integrated Modularity via HW
- Integrated Modularity via SW
  - HMI & single line diagram
  - Support for sensors
- Integrated IEC 61850
  - Reusable SW and AFLs
  - Communication based protection

- Modularity
  - All in one
  - Independent HMI with add-ons
  - “Experience”

- Virtuality
  - Measurements separated
  - Virtual relay
  - Only Web HMI

- Meshed
  - Remote meas.
  - Augmented sensors
  - Active sensing
  - Predictive operations
  - More control functions
  - DC
  - Optimization
What’s next?