

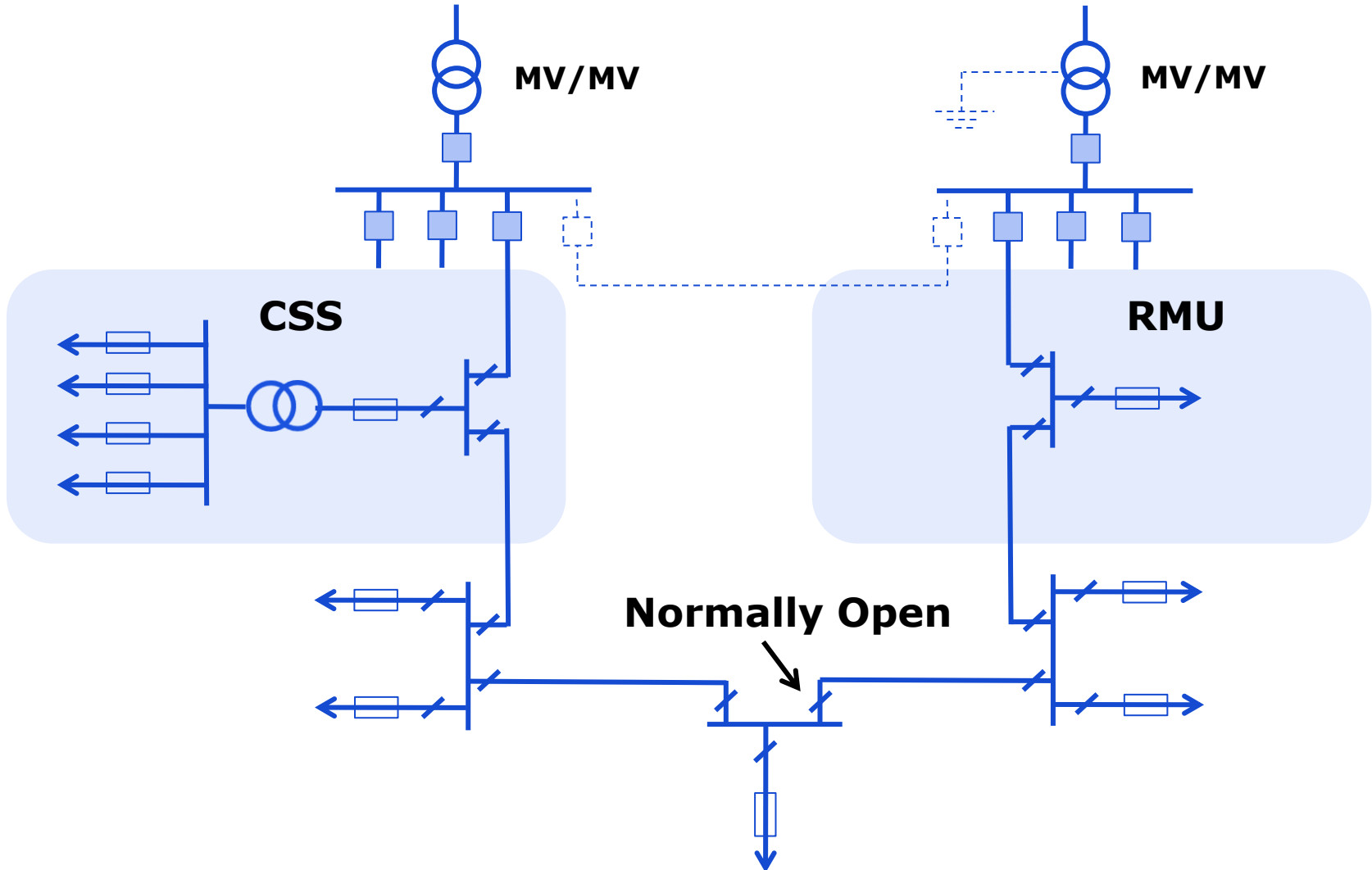


Frankfurt (Germany), 6-9 June 2011

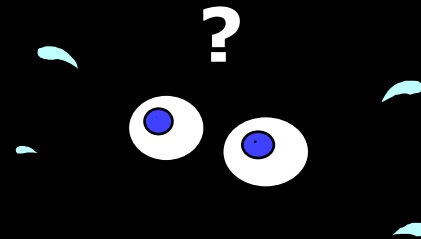
---

## **COMPACT SECONDARY SUBSTATION IN A FUTURE MEDIUM VOLTAGE DISTRIBUTION NETWORK**

- ❑ Traditional distribution ring network
- ❑ New areas of distribution grid automation
- ❑ The Zone Concept
- ❑ Smart Compact Secondary Substation
- ❑ Conclusion



# What does utility know about secondary distribution network today?

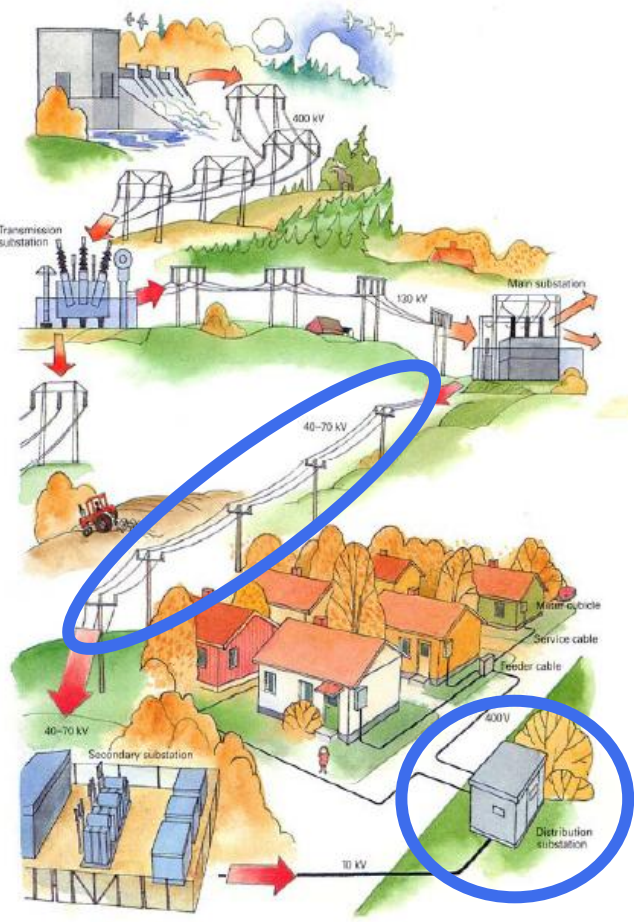


## Traditional distribution ring network

### The Challenges:

- ❑ Increased focus on power quality and reliability due to integration of renewable energy sources
- ❑ Penalty systems for loss of energy supply
- ❑ Fused protection lead to manual resources for fuse replacement in case of a failure
- ❑ How to get the needed monitoring and automation functions integrated at an acceptable cost

## Penetration of automation in the secondary distribution

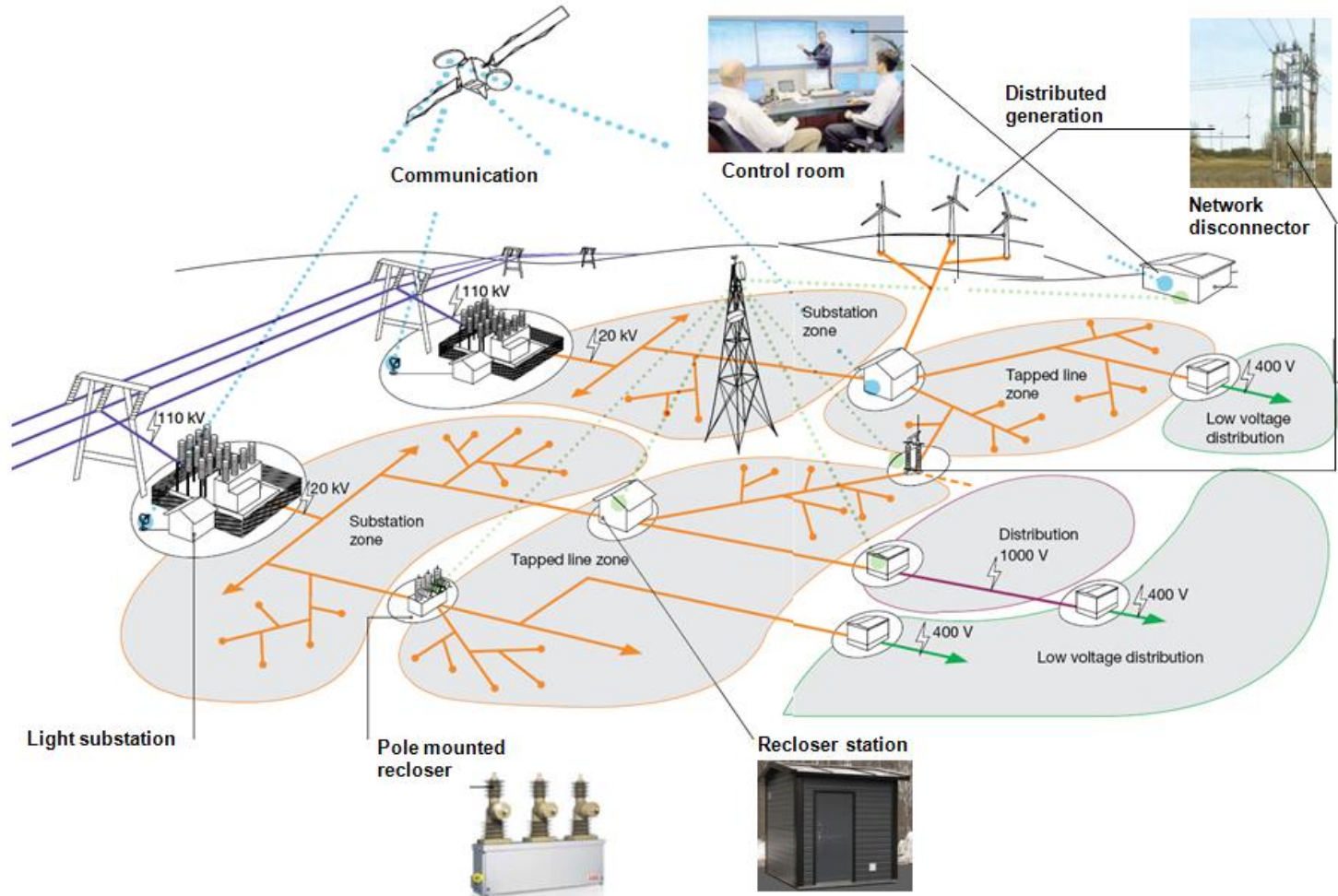


- ❑ Fault Passage Indication
- ❑ Monitoring of Voltages and Currents
- ❑ Remote Control of switches
- ❑ Selective Protection with breakers/reclosers along feeders
- ❑ Efficient Communication

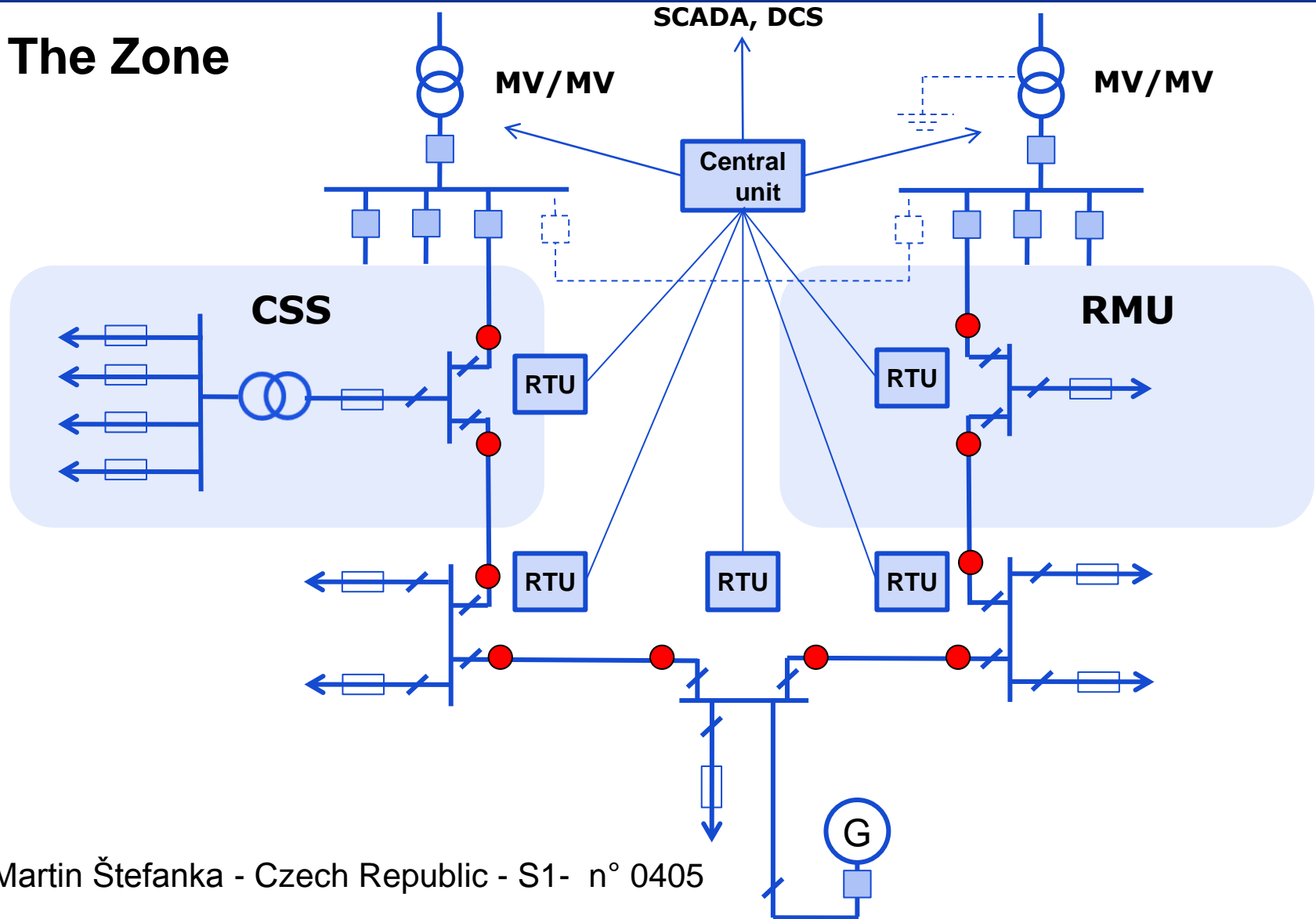
## The Zone Concept

- ❑ A network topology where the distribution network is divided into zones based on consumption criticality and the disturbance vulnerability
- ❑ The Zones are divided by circuit breakers into protection zones and by switches into control zones, with remote communication and various degrees of intelligence for protection, measurement and control

# The Zone Concept



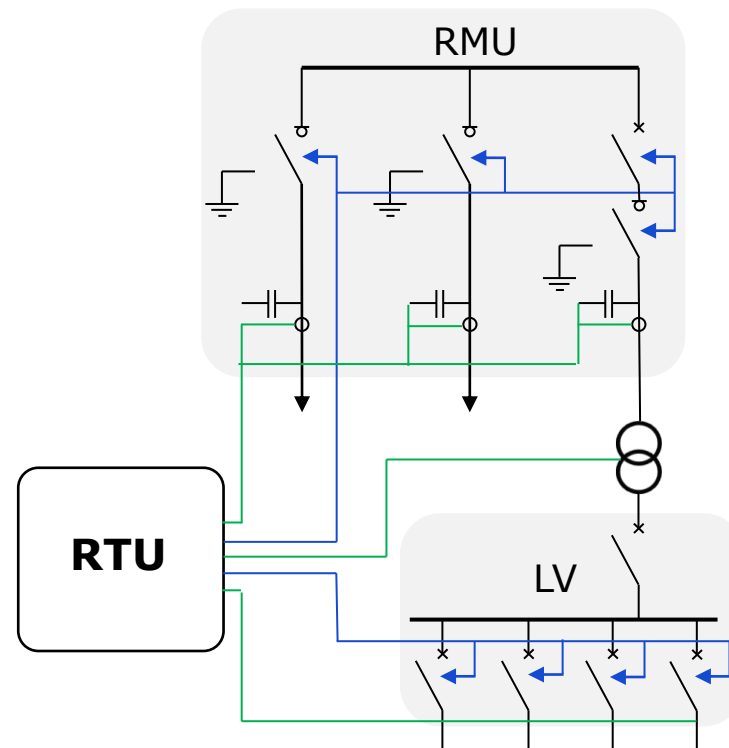
# The Zone





## Smart Compact Secondary Substation or RMU

- Key note in Zone concept



# When utility knows about secondary distribution network !

