



TECHNISCHE
UNIVERSITÄT
WIEN
Vienna University of Technology

ESEA
Institut für Energiesysteme
und Elektrische Antriebe

JWG Cigre B5/C6.26/CIRED



Protection of Distribution System with Distributed
Energy Resources

- Study the impact of DER on distribution system protection taking in account DER characteristics and the possibility of islanding operation, and to provide the guidelines to protect distribution systems with DER.
 - Review on current practice for distribution system protection
 - List of the protection relevant characteristics of DER
 - Review on the impact of DER on distribution system protection, specific aspects of inverter-coupled DER units
 - Review on protection of distribution system during islanded condition
 - Recommendation on protection for distribution systems with DER
 - Recommendation on protection for islanded distribution systems

- Joint working group Cigre/CIREN
- 30 Members (Denmark, Australia, Italy, S. Korea, Spain, S. Afrika, France, Romania, Germany, Austria, Slovenia, Czech Republic, Norway, New Zealand, Finland, Canada, Portugal, Spain, United States, China, Netherlands)
- Duration April 2013 – August 2014
- Cigre Co-Chair: Paul MYRDA (EPRI)
- CIREN Co-Chair: Wolfgang GAWLIK (TU Vienna)
- Starting point: Cigre TB421 „The impact of Renewable Energy Sources and Distributed Generation on Substation Protection and Automation”

- April 2013: Kick off (Lisboa, Portugal)
- Mai 2013: Telco and LiveMeeting
- June 2013: Telco and LiveMeeting
- July 2013: Telco and LiveMeeting
- September 2013: Telco and LiveMeeting
- October 2013: Workshop (Vienna, Austria)
- December 2013: Telco and LiveMeeting
- April 2014: Workshop (Kopenhagen, Denmark)
- August 2014: Final technical brochure

Review of current practices for distribution system protection

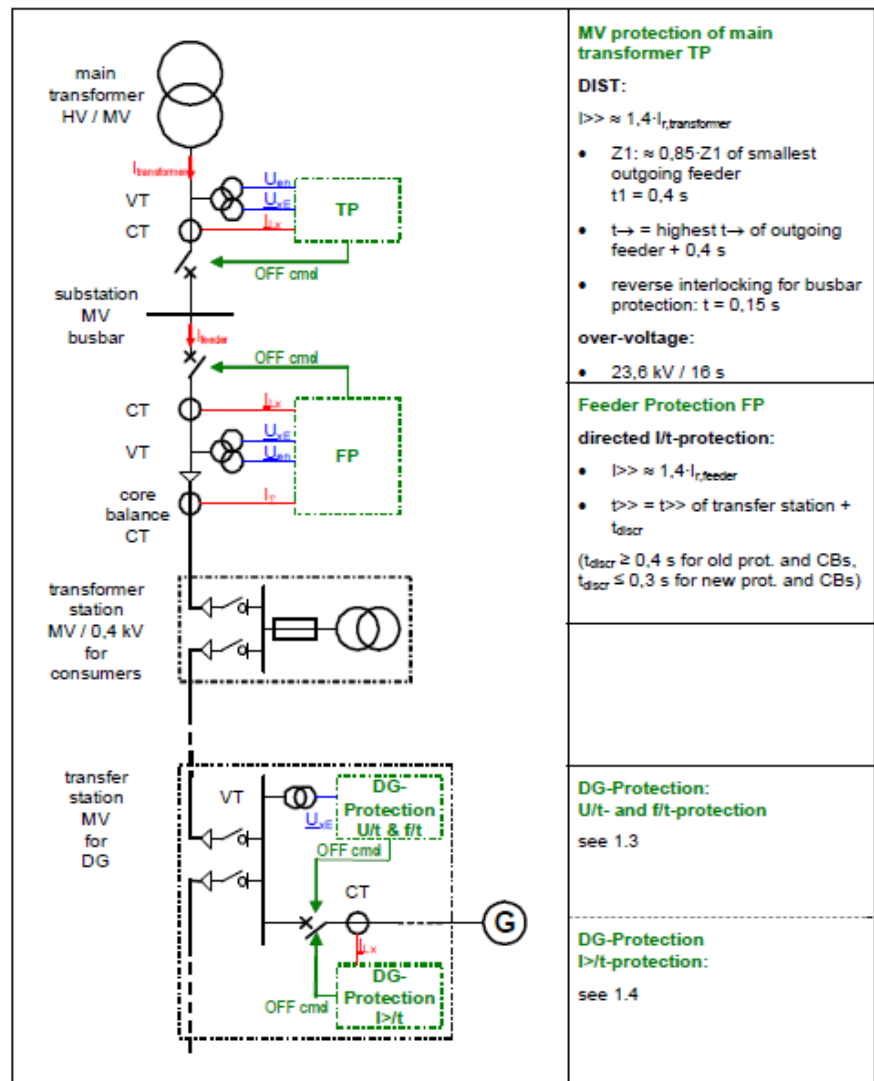
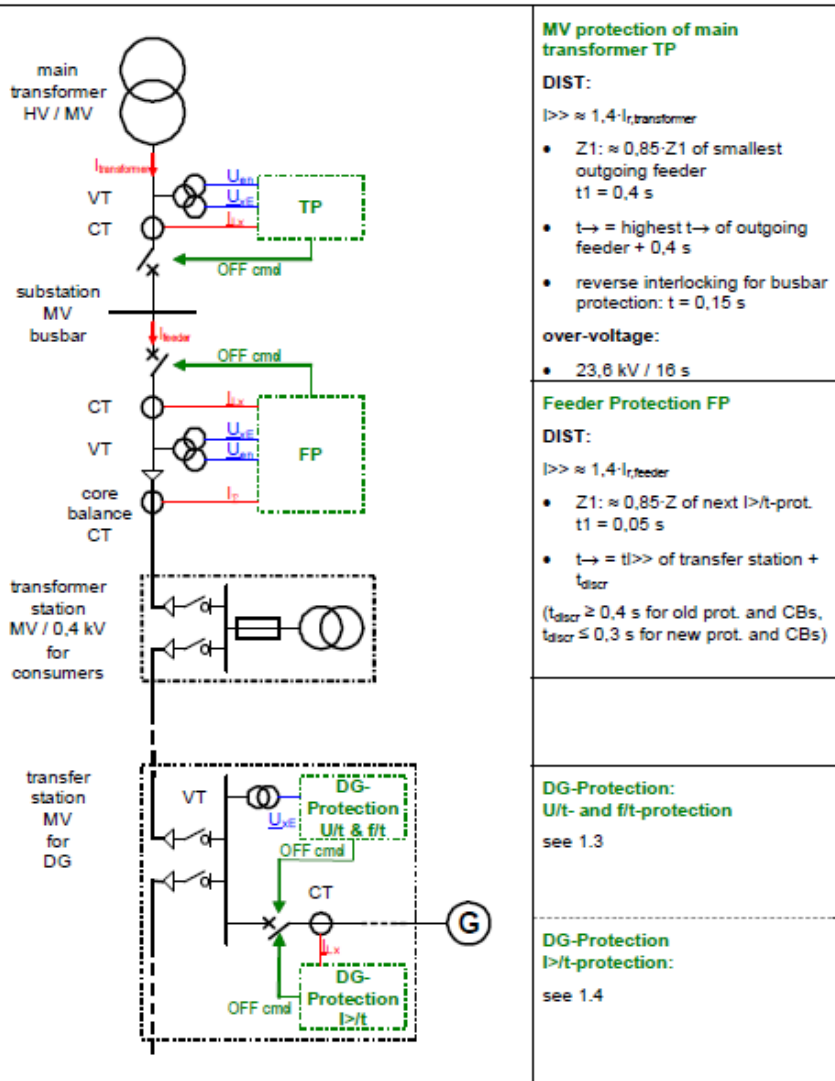
Members have submitted information regarding current protection practices for distribution systems:

- Netherlands (Stedin)
- Italy (ENEL)
- Portugal (EDP)
- Denmark (Aalborg)
- Finland (...)
- Romania (...)
- Australia (...)
- South Africa (Eskom)
- Austria (Netz NÖ)
- USA (Exelon-ComEd)
- China (...)
- Germany (EnBW)
- France (ERDF)
- Norway (REN)

Review of current protection practices (Example)

2.1 Device of Outgoing Feeder = distance protection

2.2 Protection Device of Outgoing Feeder = directed I/t-protection



- 1 Preface
- 2 Scope
- 3 Definitions
- 4 Background on Distributed Energy Resources and current practices
- 5 Protection of Distribution System with Distributed Energy Resources
- 6 Proactive approach to technology trends
- 7 Summary and outlook
- 8 Bibliography
- 9 End notes



TECHNISCHE
UNIVERSITÄT
WIEN

Vienna University of Technology

ESEA

Institut für Energiesysteme
und Elektrische Antriebe

Vielen Dank für die
Aufmerksamkeit!

wolfgang.gawlik@tuwien.ac.at