Decentralized and embedded electrical networks

Component
École Nationale Supérieure d'Électrotechnique d'Électronique d'Informatique d'Hydraulique et des Télécommunications

In brief

Code: NEGE2E

Presentation

Objectives

- Know the characteristic criteria (security, stability ...) of an embedded or decentralized electrical network compared to a conventional distribution network.
- Understand the main elements (storage ...) used in the design of such a network.
- Propose different network architectures in relation to a given specification.
- Be able to read a complete electrical diagram of a photovoltaic installation by being able to identify the various devices necessary as well as their function and sizing.

Description

1. Security and reliability

- Related concepts (fault isolation, reconfiguration, backup network, ...)
- Example of an aeronautical network

2. Mission Profile to be completed

- Interest of sources hybridization to optimize their use

- Using the Ragone plan in sizing storage units

3. Quality (AC and DC networks)

- Definition of quality standards (current, voltage)
- Quality Improvement Solutions

4. Stability (AC and DC networks)

- Architecture and operation of AC power grids
- Principles of frequency and voltage settings on networks (primary, secondary adjusments)
- Power limitation of transportation lines
- Instability related to filter - regulated system interactions

5. EMC issues

- Coupling types
- Disturbance measurements and means of protection
- EMC issues for power grids
- Problems associated with indirect lightning strike

6. Study of PV installations connected to the distribution network

- Definitions of electrical switchgears and classes of protection
- LV earth connection diagram
- Electrical surge protection
- Study of plant schematic examples

Useful info

Place

Toulouse