Paris Session 2022

Operation of AC/DC hybrid systems

Study Committee Name SC C6

Preferential Subject PS3 Question 3.8

What type of planning, protection, and control concepts are necessary for a stable operation of such hybrid systems?

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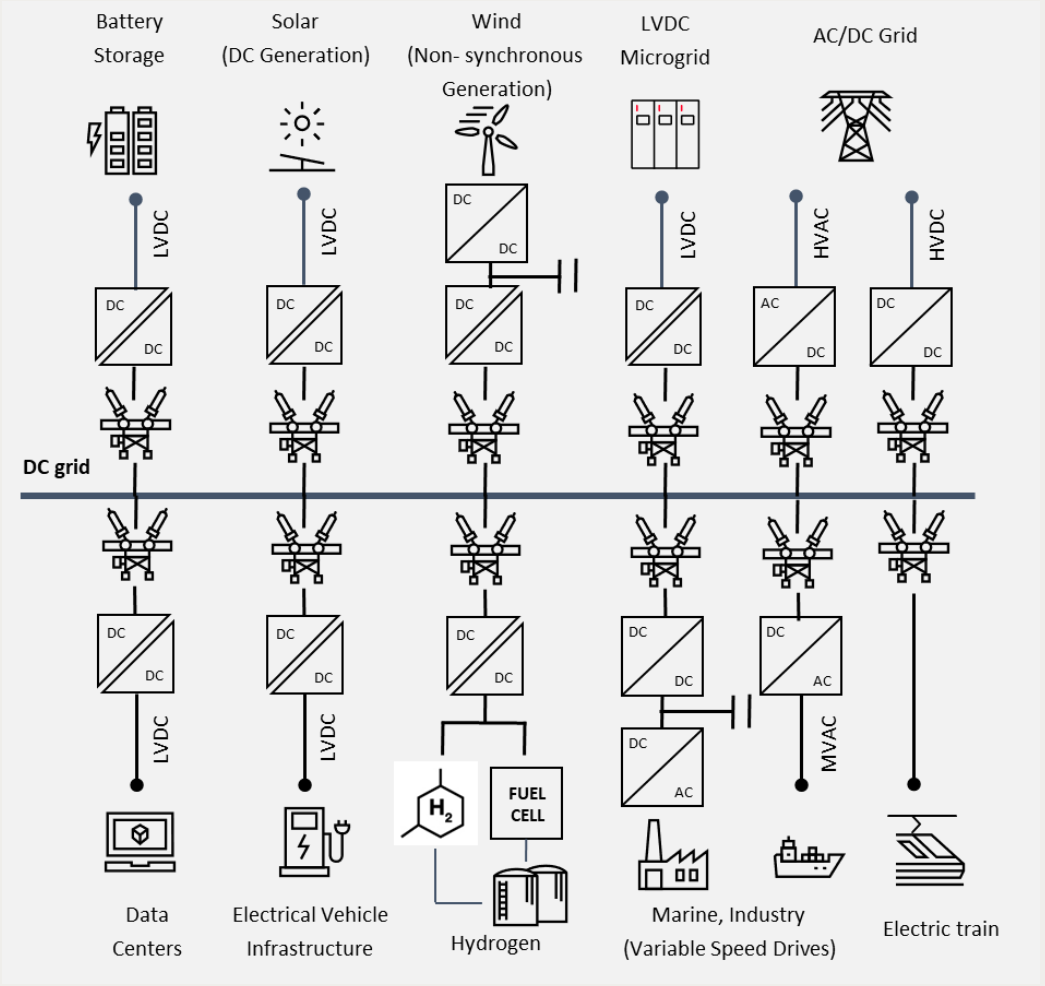
Planning, protection, and control for AC/DC hybrid systems

DC distribution systems could have more complex structures and operation modes. It leads to several challenges related to:

- Development of controllers for converters
- Development of system-levels control strategies
  - Coordination of distributed energy resources
  - Islanding operation of local distribution grid
  - Ancillary services to main grid
- Stability analysis

Main research issues are:

- Planning and energy management
- Control
- Protection



Planning, protection, and control for AC/DC hybrid systems

The hybrid grid is a very complex network with nonlinearity, randomness, bidirectional power flow,
and bidirectional communication.

Consequently, supervising the status of the whole system and dealing with the large-scale real-time data remain an open problem despite the technologies of smart devices and communication protocol.

The energy management of the hybrid grid can take profit of the experience used in the traditional power system in the monitoring and transmission of information to provide reliability and security of load supply.