

RESEARCH PROGRAMME (in the continuity of the collaboration undertaken during the visit of Eric Monmasson at the UPV, spring 2013).

Wind power plant integration using HVDC technology

- Wind power plant control for HVDC integration.
- Mitigation of wind power plant harmonics.
- Effects of control alternatives (normal operation and fault-ride-through) in the mechanical part of the wind turbine. Sub-harmonic oscillations.
- Interaction between HVDC connected Wind Power Plants and the overall AC transmission grid.

ACADEMIC PROGRAMME (2 seminars)

Wind turbine control

This seminar will introduce a detailed view on large scale wind turbine technology and the control strategies for the different parts of the system (wind turbine rotor, generator, power electronics, etc).

The main objective of the lecture is to gain a clear understanding on large wind turbine technologies, the relationship between the different technologies and the control of the overall system.

Topics:

- Fundamentals of wind power conversion and wind turbine technology.
- Control of the wind turbine rotor. Optimum power control. Pitch control.
- Generator and power electronic technology for large wind turbines.
- Generator and power electronic control for grid connected wind turbines.
- Wind turbine grid integration.

HVDC Connection of Large Wind Plants

HVDC technology is changing rapidly and is the key to the development of the new "European Supergrid". A new HVDC grid poses important challenges, especially when connected to large amounts of wind power.

Topics:

- Fundamentals of HVDC technology.
- Control of LCC-HVDC links. Integration of large wind power plants with LCC-HVDC links (Control, harmonics, protection issues).
- Control of VSC-HVDC links. Integration of large wind power plants with VSC-HVDC links. (Control, harmonics, protection issues).
- Multiterminal and hybrid HVDC-grids.