# Selective Control for a VSC-HVdc

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Utilization of power electronics based controllable systems (or devices) in transmission systems has opened new opportunities for the power industry to optimize utilization of the existing transmission systems and at the same time to keep high system reliability and security.

Voltage Source Converters-based High Voltage direct current (VSC-HVdc) systems have the ability to rapidly control the transmitted active power, and also to independently exchange reactive power with transmissions systems. Therefore, VSC-HVdcs with a suitable control scheme can offer an alternative means to enhance transient stability, to improve power oscillations damping, and to provide voltage support. An interesting application of this system is the analysis of a power system when a VSC-HVdc is connected in parallel with ac transmission lines.

The main objective of the research is to develop a selective control for VSC-HVdc. Different control strategies for specific purposes (damping, transient stability, voltage stability) are implemented in the control of the VSC-HVdc. A second control, referred to as master control, receives and processes information from the power system. According to this analysis, the master control identifies the dynamic condition of the power system and gives the command to switch to an specific control strategy.

The control strategies implemented in the control of the VSC-HVdc are based on different theory frames. The control strategy for enhancing transient stability is based on the theory of Control Lyapunov Function and the control strategy for increasing the damping is based on Linear Analysis. Increase of damping can be achieved by either modulating the active power or the reactive power.

**Biography:**

Hector Latorre was born in Colombia in 1972. He obtained his Electrical Engineer degree (B.Sc) from National University of Colombia in 1995. He was employed by Interconexion Electrica S.A. (ISA), Colombia, in the area of design of substations where he worked for 9 years. During this working period time, he went to Sweden to study the master program in Electrical Engineering offered by the Royal Institute of Technology (KTH). He received the M.Sc. degree in 2002. In his master thesis he analyzed the application of a TCSC in the interconnection between Colombia

and Ecuador. He has also studied postgraduate programs in administration and management. He is currently Ph.D. student in the field of power systems at the Royal Institute of Technology (KTH).