HVDC (High Voltage Direct Current) Systems

The HVDC technology (High Voltage Direct Current) is used to transmit electricity over long distances by overhead transmission lines or submarine cables. It is also used to interconnect separate power systems, where traditional alternating current (AC) connections cannot be used. ABB pioneered the HVDC technology and is the undisputed world leader in the HVDC field.

In a high voltage direct current (HVDC) system, electric power is taken from one point in a three-phase AC network, converted to DC in a converter station, transmitted to the receiving point by an overhead line or cable and then converted back to AC in another converter station and injected into the receiving AC network. Typically, an HVDC transmission has a rated power of more than 100 MW and many are in the 1,000 - 3,000 MW range.

HVDC transmission is used for transmission of power over long or very long distances, 500-1500 miles, because it then becomes economically attractive over conventional AC lines.

With an HVDC system, the power flow can be controlled rapidly and accurately as to both the power level and the direction. This possibility is often used in order to improve the performance and efficiency of the connected AC networks. HVDC also provides isolation from disturbances that occur within the connected AC networks.

HVDC Thyristor Valves