

## PEE6J003 HIGH VOLTAGE DC TRANSMISSION (4-0-0)

(Revised)

### MODULE-I[12 hrs]

**INTRODUCTION TO HVDC TRANSMISSION:** Basic concepts of power transmission, Comparison of AC and DC Transmission, Application of DC transmission, description of dc transmission system, Planning of HVDC transmission. Modern trends in HVDC technology. Operating problems in HVDC transmission. HVDC transmission based on voltage converters.

### MODULE-II[12 Hrs]

**TYPES OF CONVERTERS:** Line commutated converters and voltage source converters. Analysis of HVDC converters.

**CONTROL OF HVDC CONVERTER AND SYSTEMS:** Principle of DC link control, Converter control characteristics, firing angle control, current and extension angle control, starting and stopping of DC link, Synchronisation techniques for power converters.

### MODULE-III[10 hrs]

**CONVERTER FAULT & PROTECTION:** Converter faults – protection against over current and over voltage in converter station – surge arresters – smoothing reactors – DC breakers – Audible noise-space charge field-corona effects on DC lines- Radio interference\

**REACTIVE POWER AND HARMONICS CONTROL:** Reactive power requirements in steady state – Sources of reactive power – SVC and STATCOM – Generation of harmonics – Design of AC and DC filters – Active filters

### MODULE-IV[8 hrs]

**POWER FLOW ANALYSIS IN AC/DC SYSTEMS:** Modelling of DC Links-DC Network-DC Converter-Controller Equations-Solution of DC loadflow – P.U. System for d.c. quantities-solution of AC-DC Power flow-Simultaneous method Sequential method.

#### Text Book:

1. HVDC Power Transmissions Systems: Technology & Systems Interaction, K.R.Padiyar, New Age Publication, 2005

#### Reference Book(s):

1. "HVDC Transmission" By S. Kamakshiah & V. Kamaraju, TMH Education Private Ltd., 2011, New Delhi.
2. "HVDC and FACTS controllers" by Vijay K. Sood, KLUWER academic publishers.