

(ELECTIVE – D/II)**4/4 B.Tech. SEVENTH SEMESTER****EE7T6D****EHVAC TRANSMISSION****Credits:3****Lecture: 3 periods/week****Internal assessment: 30 marks****Tutorial: 1 period /week****Semester end examination: 70 marks****Course Objective:**

This subject deals with the detailed analysis of line parameter calculation in EHVAC transmission. Information about voltage gradients of conductors and electro static field in addition with corona effects and voltage control.

Course Outcomes:

After completing this course student is able to

1. Evaluate EHVAC transmission system with all parameters
2. Understand electrostatic effects in EHVAC transmission
3. Understand effects of Corona in EHVAC transmission
4. Select a suitable voltage controller for a EHVAC transmission system

UNIT I**Introduction -Transmission line Trends**

Necessity of EHV AC transmission, advantages and problems, power handling capacity and line losses, mechanical considerations, resistance of conductors, temperature rise of conductors and current-carrying capacity, properties of bundled conductors – problems.

UNIT II**Line and Ground Reactive Parameters**

Inductance of EHV line configurations, line capacitance calculation, sequence inductances and capacitances, line parameters for modes of propagation, resistance and inductance of ground return.

UNIT III**Voltage Gradients of Conductors**

Electrostatics, field of sphere gap, field of line charges and properties, charge - potential relations for multi-conductors lines, surface voltage gradient on conductors, distribution of voltage gradient on sub-conductors of bundle, effect of high electro static field on Humans, animals and plants.

UNIT IV**Corona Effects**

I^2R loss and corona loss, corona-loss formulae, charge-voltage ($q-V$) diagram and corona loss, attenuation of travelling waves due to corona loss, audible noise: generation and characteristics, limits for audible, audible noise measurement and meters, formulae for audible noise and its use in design, relation between single-phase and three-phase AN levels examples.

UNIT V**Power-Frequency Voltage Control:**

Problems at power frequency, generalized constants, no-load voltage conditions and charging current, power circle diagram and its use, voltage control using synchronous condensers, cascade connection of components, shunt and series compensation, sub-synchronous resonance in series-capacitor compensated lines, static reactive compensating systems (static VAR'S).

Learning Resources

Text Book:

EHVAC Transmission Engineering - Rakosh Das Begamudre, New Age International Publishers, Third Edition.

Reference Book:

EHV-AC, HVDC Transmission & Distribution Engineering - S. Rao, Khanna Publishers, Third Edition.