

## **13PS1208 - VOLTAGE STABILITY**

Instruction/week: 4 hrs.  
Univ. Exam: 3 hrs.

Max. Sessional marks: 40  
Univ. Exam marks: 60

### **UNIT -I**

**INTRODUCTION TO VOLTAGE STABILITY:** Definitions-Voltage Stability, Voltage Collapse, Voltage Security; Physical relation indicating dependency of voltage on reactive power flow; Factors affecting Voltage collapse and instability; Previous cases of voltage collapse incidences.

### **UNIT-II**

**GRAPHICAL ANALYSIS OF VOLTAGE STABILITY:** Comparison of Voltage and angular stability of the system; Graphical Methods describing voltage collapse phenomenon: P-V and Q-V curves; detailed description of voltage collapse phenomenon with the help of Q-Vcurves.

### **UNIT-III**

**ANALYSIS OF VOLTAGE STABILITY:**

**Analysis of voltage stability on SMLB system:** Analytical treatment and analysis.

**Voltage Stability Indices :** Voltage collapse proximity indicator; Determinant of Jacobin as proximity indicators; Voltage stability margin.

### **UNIT-IV**

**POWER SYSTEM LOADS:**

**Loads that influences voltage stability:** Discharge lights, Induction Motor, Air-conditioning, heat pumps, electronic power supplies, OH lines and cables.

**Reactive Power Compensation:** Generation and Absorption of reactive power; Series and Shunt compensation; Synchronous condensers, SVCs; OLTCs; Booster Transformers.

### **UNIT-V**

**VOLTAGE STABILITY MARGIN:**

**Stability Margin:** Compensated and un-compensated systems.

**Voltage Security:** Definition; Voltage security; Methods to improve voltage stability and its practical aspects.

### **TEXT BOOKS:**

1. "Performance, operation and control of EHV power transmission system"- A.CHAKRABARTHY, D.P.KOTARI and A.K.MUKOPADYAY, A.H.Wheeler Publishing, I Edition, 1995.
2. "Power System Dynamics: Stability and Control" – K.R.PADIYAR, II Edition, B.S.Publications.

**REFERENCE:** 1. "Power System Voltage Stability"- C.W.TAYLOR, Mc Graw Hill, 1994