

AMEE11 FLEXIBLE AC TRANSMISSION SYSTEMS

UNIT-1 INTRODUCTION

- 1.1 Electrical transmission network
- 1.2 Need of transmission interconnections
- 1.3 Power flow in AC systems- power flow and dynamic stability considerations
- 1.4 Relative importance of controllable parameters
- 1.5 Basic types of FACTS controllers Brief description && definitions
- 1.6 Benefits from FACTS technology.

UNIT-2 STATIC VAR COMPENSATOR (SVC)

- 2.1 Introduction to shunt compensation
- 2.2 Objectives of Shunt compensation
- 2.3 Voltage control by SVC- VI characteristics- advantages of slope in dynamic characteristics
- 2.4 Influence of SVC on system voltage, SVC applications:
- 2.5 Steady state power transfer capacity
- 2.6 Enhancement of transient stability
- 2.7 Prevention of voltage instability
- 2.8 Introduction to PODC.

UNIT-3 THYRISTOR CONTROLLED SERIES CAPACITOR (TCSC)

- 3.1 Introduction to series compensation- Objectives of series compensation- Operation of TCSC:
- 3.2 Different modes of operation- Modeling of TCSC: variable reactance model,
- 3.3 Transient stability model- TCSC applications: Improvement of system stability limit
- 3.4 Voltage collapse prevention

UNIT-4 EMERGING FACTS CONTROLLERS

- 4.1 Basic concept of voltage source converters and current source converter, SSSC
- 4.2 Principle of operation- Applications,
- 4.3 STATCOM- principle of operation
- 4.4 VI characteristics- Applications- UPFC: Modes of operation- Applications
- 4.5 Introduction to IPFC- Comparison of SVC and STATCOM

UNIT-5 STATIC VOLTAGE AND PHASE ANGLE REGULATOR

- 5.1 Objectives of voltage and phase angle regulators
- 5.2 Approaches to thyristor controlled voltage and phase angle regulators
- 5.3 Industrial applications of FACTS devices- Case studies

Reference Books:

1. Narain G. Hingorani and Laszl Gyugyi, "Understanding FACTS – Concept & technology of flexible AC transmission systems", Standard publishers distributors, IEEE press, 2001.
2. Padiyar. K. R, "FACTS Controllers in Power Transmission and Distribution", New Age International (P) Limited, Publishers, New Delhi, 2008