COURSE	Name	: High Voltage Transient Phenomena
	Code	: EE184911
	Credits	: 3
	Semester	: Elective

Description of Course

Transient high voltage phenomenadiscuss about transient phenomenon that may occur in the electric power system, especially in high voltage, such as: switching, lightning and transients with fast duration (less than 1 second). The discussion includes the symptoms of the emergence of phenomenon, causes, impacts on electrical equipment and human safety to the general prevention methods.

Learning Outcomes

Knowledge

(P02) Mastering the concepts and principles of engineering, and implementing them in the form of procedures for analysis and design in power systems, control systems, multimedia telecommunications, or electronics.

Specific Skill

(KK02) Able to describe the completion of engineering problems in power systems, control systems, multimedia telecommunications, or electronics.

General Skill

(KU01) Able to apply logical, critical, systematic and innovative thinking in the context of development or implementation of science and technology that concerns and implements the value of humanities in accordance with their area of expertise.

Attitude

(S12) Working together to be able to make the most of his/her potential.

Course Learning Outcomes

Knowledge

Mastering the concept of transient events in the electric power system, causes, impacts, and factors that cause these transient symptoms.

Specific Skill

Able to describe the problem solving of high voltage transient phenomenon in electric power systems.

General Skill

Able to calculate and design protection of high voltage electrical equipment to interference due to transient phenomenon.

Attitude

Working together to make use of their maximum potential.

Main Subjects

1. Basic concepts of RLC circuits and system modeling
2. The concept and classification of transient phenomenon in electric power systems
3. The working principle of Circuit Breaker (CB) and switching phenomenon
4. The process of the phenomenon of lightning and the protection system against lightning
5. Shielding failure and back flashover
6. Traveling wave
7. Protection of high voltage equipment and substations
8. Working principle of surge arresters
9. Inrush current, Ferro resonance phenomenon.
10. Transient simulation with EMTP / ATPDraw software.

Reference(s)

[1] Negara, I Made Yulistya, "Teknik Tegangan Tinggi; Prinsip dan Aplikasi Praktis", Graha Ilmu, Yogyakarta, 2013
[2] Martinez-Velasco, Juan, "Transient Analysis of Power Systems: Solution Techniques, Tools, and Applications", IEEE Press, 2015
[3] Ametani, Akihiro, et.al, "Power System Transients: Theory and Applications", CRC Press, 2017
[4] JC. Das, "Transients in Electrical Systems: Analysis, Recognition, and Mitigation", McGraw-Hill, 2010
[5] Su, Charles Q, "Electromagnetic Transients in Transformer and Rotating Machine Windings", IGI Global, 2013

Prerequisite(s)

EE184513 High Voltage Engineering