

King Fahd University of Petroleum & Minerals

Electrical Engineering Department

EE 620: High Voltage Engineering
(First Semester 051)

Term Paper

Introduction

Catastrophic failures of the HV apparatus such as GIS, HV cable termination, Rotating Machines and power transformers are usually preceded by problems in the insulation structure. Previous research has shown that the degree of partial discharge phenomenon is associated with the level of deterioration in insulating material which makes PD signal a perfect candidate to judge insulation deterioration. Their early detection could prevent the occurrence of such costly incidents.

Currently, the on-line partial discharge monitoring instruments available in the industry are based on either acoustic or electrical measurement techniques, each with its merits and deficiencies. Before investing in installing on-line partial discharge monitoring facilities, there is a need for an electric utility to be fully aware of the options available and the potential benefits and drawbacks of each option.

You are expected to do the following:

a) Select one of the following topics:

- 1) CONDITION DIAGNOSIS OF GIS USING ON-LINE PARTIAL DISCHARGE INSTRUMENTS.**
- 2) CONDITION DIAGNOSIS OF CABLE TERMINATIONS USING ON-LINE PARTIAL DISCHARGE INSTRUMENTS.**
- 3) CONDITION DIAGNOSIS OF TRANSFORMERS USING ON-LINE PARTIAL DISCHARGE INSTRUMENTS.**
- 4) CONDITION DIAGNOSIS OF ROTATING MACHINES USING ON-LINE PARTIAL DISCHARGE INSTRUMENTS.**

b) Conduct a literature survey on the theory, techniques and availability of on-line partial discharge monitoring instruments and their application on GISs, cable terminations, rotating machines and transformers.

c) Contact leading equipment manufacturers worldwide to survey their views regarding the use of partial discharge monitoring equipment.

d) Contact of leading electric utilities worldwide to survey their on-line partial discharge monitoring operating experience. The survey will include, but not limited to, the basis of choosing a particular type of instrument, cost/benefit comparison and operating problems (if any).

e) Prepare a technical report and a power point presentation that includes your findings.