



SUMMARY OF GIS/AIS INSULATION COORDINATION STUDIES

Insulation coordination is a process in which the appropriate insulation levels for equipment and the corresponding overvoltage protection system (e.g., surge arresters) are coordinated with the expected overvoltages that can occur in a power system. There are three basic elements to insulation coordination, which are:

- Determining the overvoltage stresses from the system
- Knowing the strength of the insulation of specific equipment in the substation
- Selecting surge arrester ratings and locations, or other mitigation equipment or operating restrictions, to ensure the system-imposed overvoltages do not exceed the insulation strength of the equipment including an appropriate protective margin

The expected stresses from the system can be determined by simulation, the insulation strength is an inherent characteristic of the equipment, leaving the output of an insulation coordination study to be the selection and placement (or verification) of properly sized surge arrester(s).

In power systems, there are four general types of overvoltage stresses that can be experienced by equipment. These are:

- Maximum continuous operating overvoltage
- Temporary overvoltages (at or near fundamental frequency)
- Switching overvoltages
- Lightning overvoltages

Based on these types of overvoltages, the elements that influence the selection of surge arresters are as follows:

- The lightning current discharge capability and its corresponding voltage
- The switching current discharge and corresponding voltage
- The energy dissipation characteristics of the arrester
- The arrester rated voltage
- The maximum continuous operating voltage

MEPPI has performed a wide variety of detailed studies. More information on specific analysis types is available upon request.

