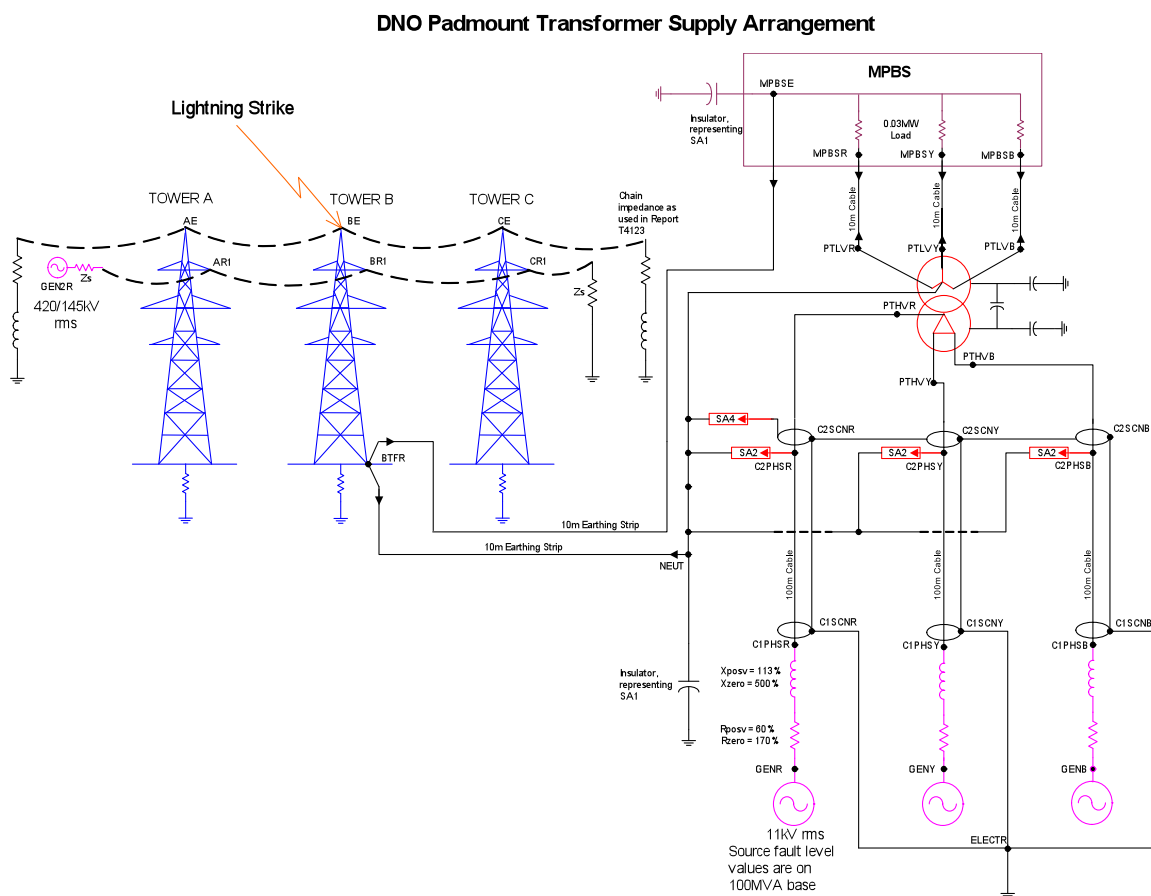


## Case Study 3

Insulated Base Station design power supply arrangement for mobile phone antennae located on HV transmission lines

## Project Scope

To investigate the magnitude of overvoltages produced by lightning phenomena striking transmission towers that also support mobile phone antennae or dishes. The purpose of the studies was to ascertain the transient voltages occurring on the antenna power supply.



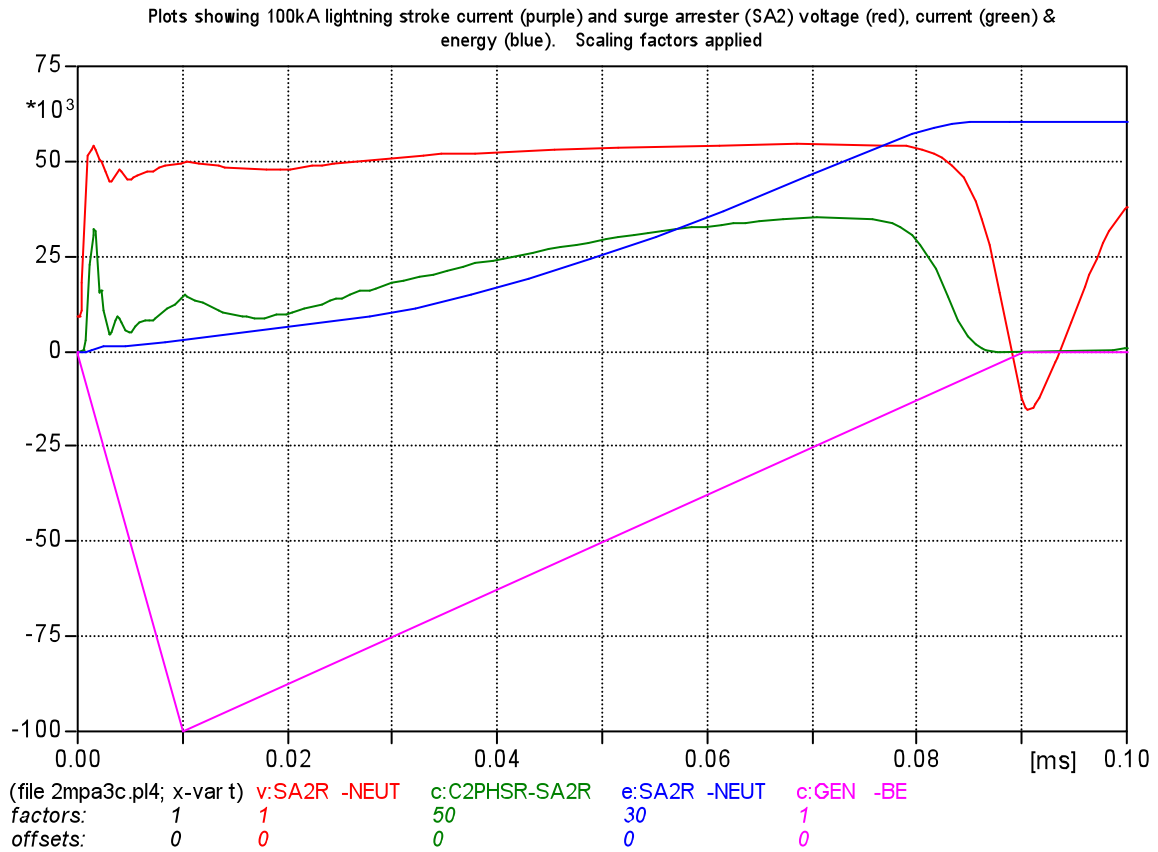
## Modelling

The following network equipment was modelled using the Electro Magnetic Transient Program.

11/0.433kV, 200kVA Transformer	(3-phase representation)
Overhead Line ; Type – Lynx	(Untransposed, modelling mutual effects)
11kV Underground Cable	(Modelling mutual effects)
21kV, 4.5kJ/kV Metal Oxide Surge Arresters	(Non linear resistor)
Towers ; Types – L4 & L4M	(Gap model representing gap breakdown voltage)

The studies examined combinations of 132kV and 400kV overhead lines / towers with lightning stroke currents of 30kA, 50 kA and 100kA and soil resistivities of 100Ωm, 500Ωm and 1000Ωm.

## Results



Narec Power System Analysis Section demonstrated to the client which combinations of lightning stroke current and surge arrester protection achieved transient overvoltages within the basic insulation level of the equipment.