To use per-unit calculations, first define our nominal or base quantities

Per unit impedances are defined normalized to the base impedance

Impedance is defined as usual in the cartesian plane with resistance (real axis) and reactance (imaginary axis)

X over R (XoR) is a commonly defined parameter that defines the ratio of X to R, either in absolute or per unit

XoR and per unit impedance can be used to work out per unit resistance and reactance

A baseline loss can be found from an efficiency at an operating point S

Loss due to current can be determined using per unit values

This general equation is used when calculating load-based loss later, but given a nominal operating point V = Vn.

And since S is typically given as a percentage of Sn, load factor F, the equation simplifies further to

We then find Pnoloadloss to use for future loss calculations