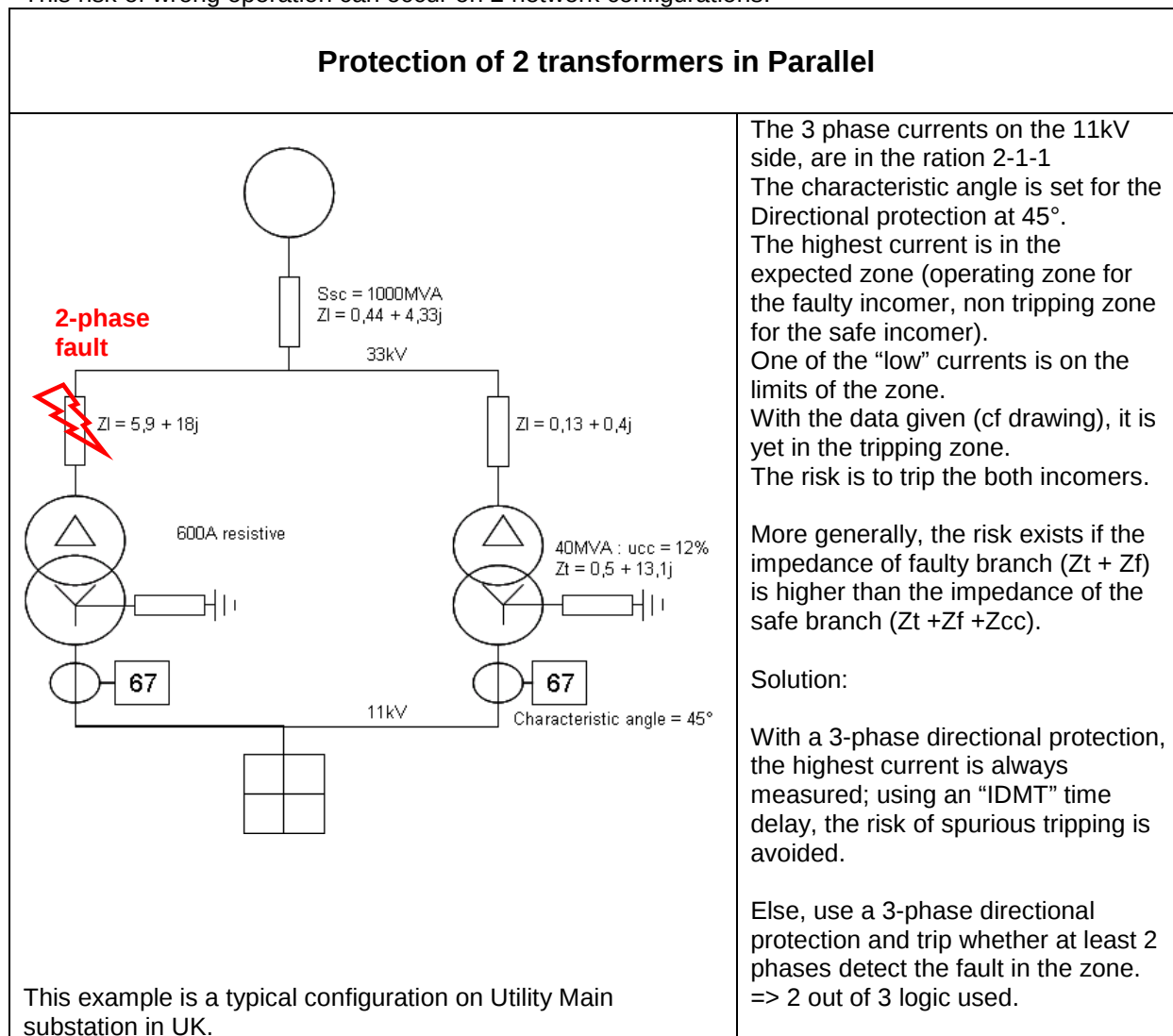


Wrong operation situation of the Directional Phase Over-current:

The standard setting for the angle is 45° .

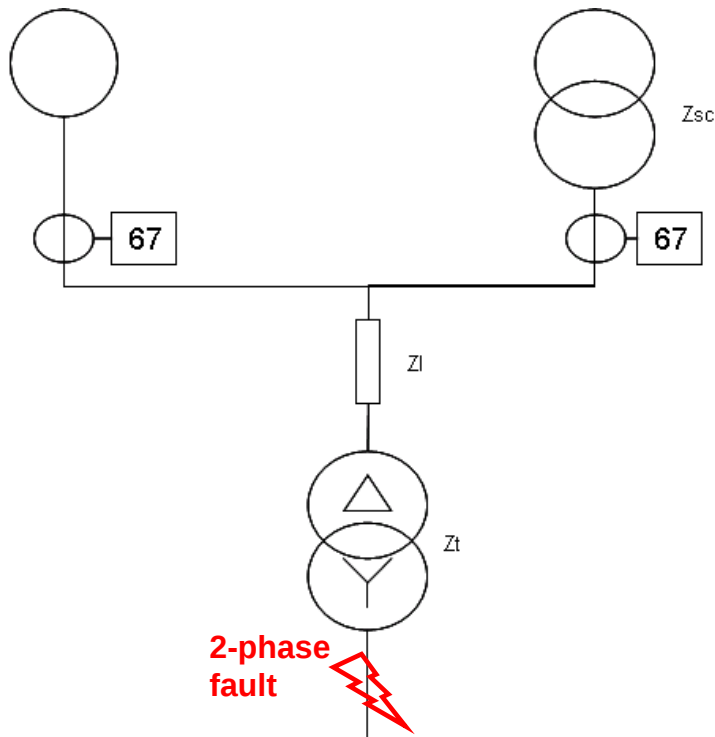
With such a setting, it exists a risk of non detection or/and unwanted tripping: detection of a fault on the opposite side of a transformer Yd or Dy.

This risk of wrong operation can occur on 2 network configurations:



This example is a typical configuration on Utility Main substation in UK.

Protection of 2 Incomers



This fault is quite similar from the previous one.
Only the values change.

The 3 currents seen by the directional protection are in the ratio 2-1-1.

One of the "low" currents is in the wrong zone, whether the impedance of the faulty branch ($Z_t + Z_l$) is higher than the short-circuit impedance, which is often the case.

Consequence : spurious tripping of one or both incomers.

Solution :

Set up the threshold of the directional higher than the 2-phase short-circuit current at the secondary side.

Else, set up the angle at 30° .

Else more, use a 3-phase directional protection and trip if 2phases at least are detecting the fault in the zone.