ESF II project of the University of West Bohemia in Pilsen

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MINISTRY OF EDUCATION,
YOUTH AND SPORTS

Fault currents and voltages during 3-phase fault

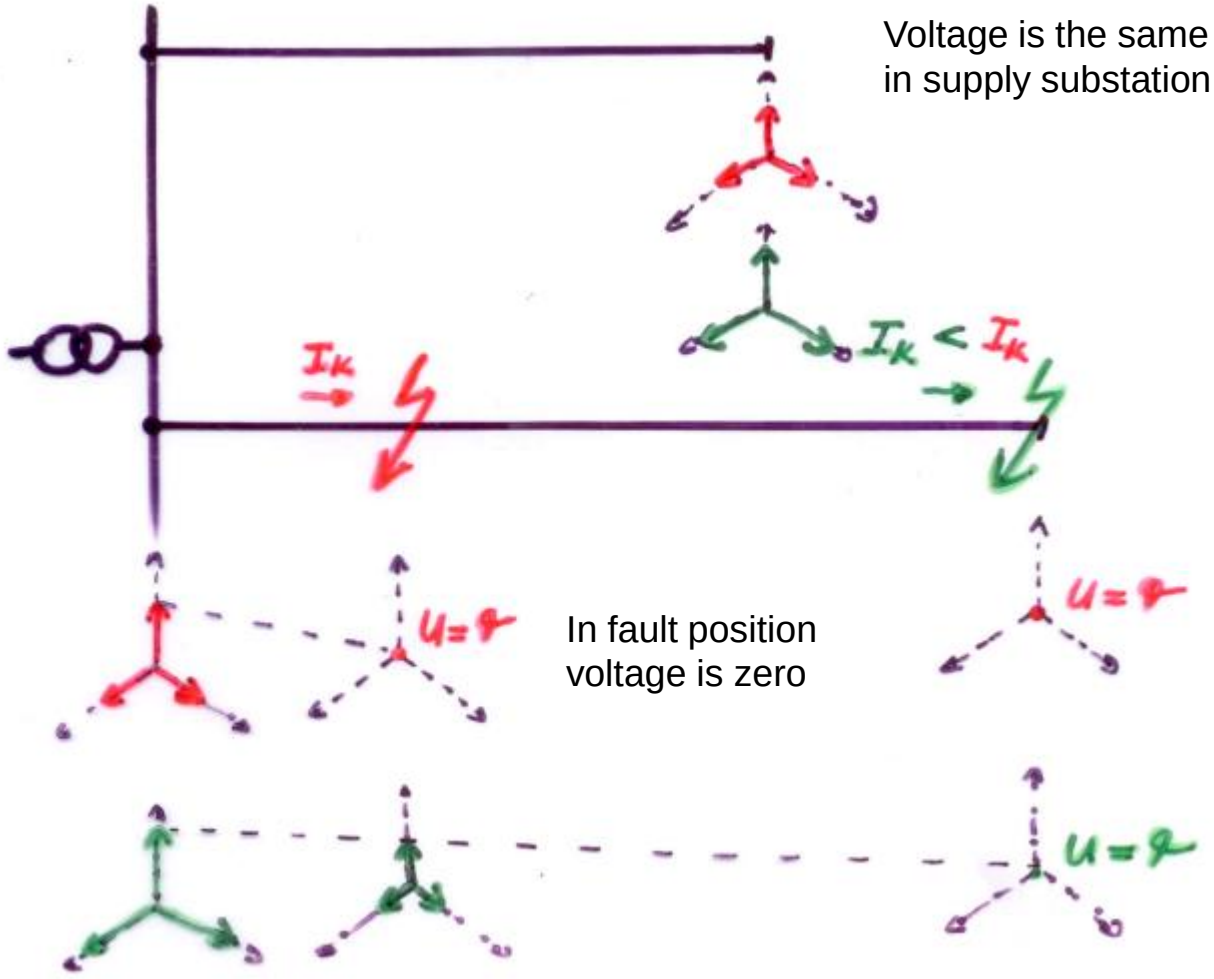
- are the same for all ways of neural earthing
- DO NOT depend on neutral earthing

Voltage in supply substation depends on fault location

$U = Z_V \cdot I_k$

Z_V - impedance of line between substation and fault position
$Z_V = Z_{kV} \cdot L$
L – distance between substation and fault position

More distant fault = lower impact on voltage in supply substation and other end-users



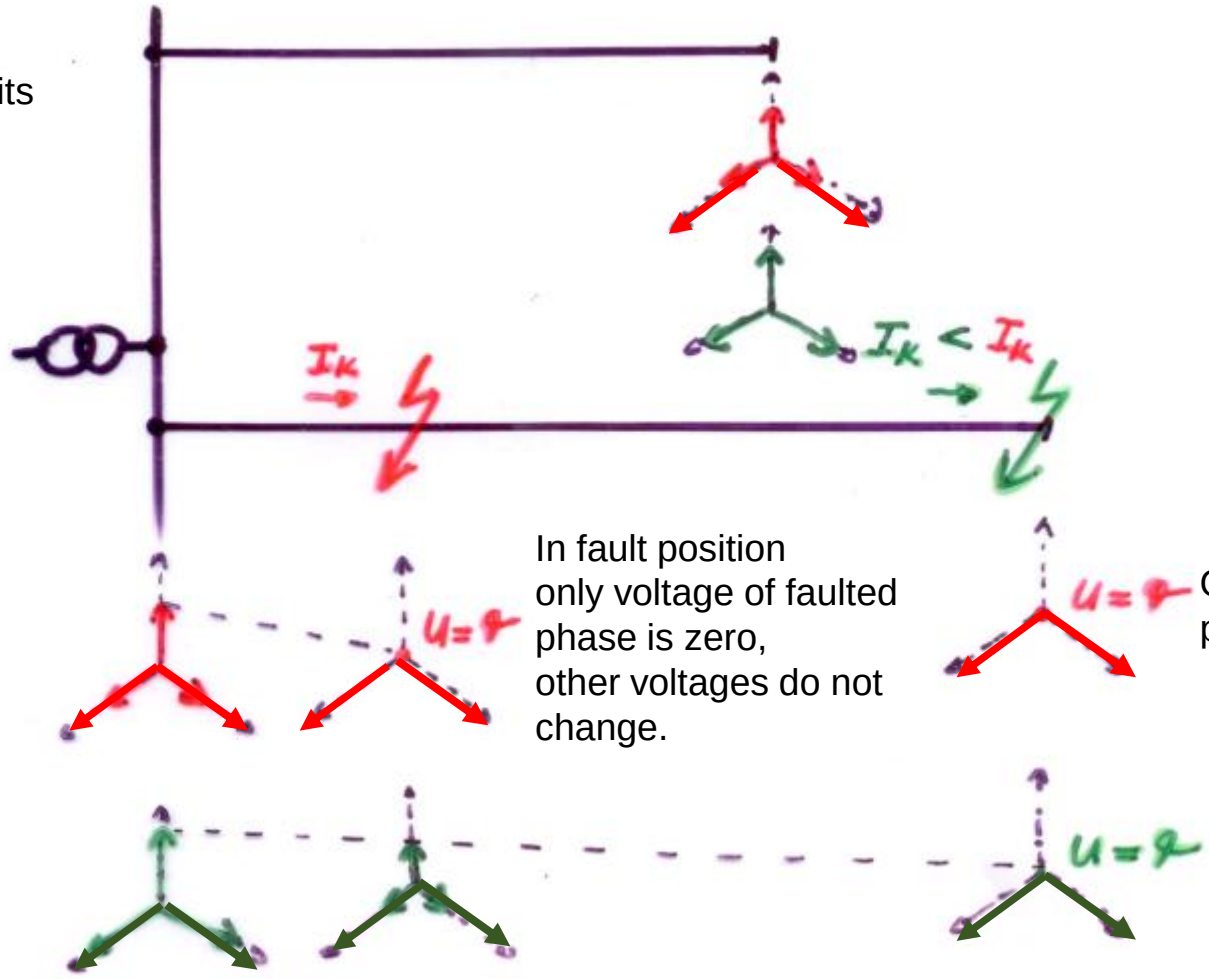
Voltage is the same as in supply substation

In fault position voltage is zero

In node behind the fault position, voltage is also zero

Fault currents and voltages during 1-phase ground fault

- depend on neutral earthing
- directly grounded networks → 1-ph short-circuits



Voltage faulted phase in supply substation depends on fault location

In fault position only voltage of faulted phase is zero, other voltages do not change.

Only voltage of faulted phase is zero

More distant fault = lower impact on voltage in supply substation and other end-users

Fault currents and voltages during earth fault

- depend on neutral earthing
- undirectly grounded networks or networks with isolated neutral → earth faults

Neutral grounding voltage
during earth fault has phase-to-ground voltage

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In all nodes,
voltage of faulted phase is zero,
other phases have phase-to-phase voltage.

Fault current does not depend on fault position.

