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SECTION TITLE

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SECTION TITLE

MATLAB CODE TO CALCULATE THE LINE VOLTAGES Vbc AND Vca

```
Ea=1 + 0i;
Z1= 0.25i; Z2=0.35i; Z0=0.1i;
% Assuming the fault occurs at phase'a', the positive sequence component of
% current in the 'a' phase(for a single line to ground fault without
% impedance)
Ia1=(Ea/(Z1+Z2+Z0));
%Also,for a single line to ground fault,Ia1=Ia2=Ia0
Ia2=Ia1;
Ia0=Ia1;
%Als, fault current in phase 'a',Ia=Ia1+Ia2+Ia0
Ia=3*(Ia1);
%From the positive sequence network
Va1=Ea-(Ia1*Z1);
%From the negative sequence network
Va2=-Ia2*Z2;
%From the zero sequence network
Va0=-Ia0*Z0;
%For operator 'a' i.e. an operator which causes a rotation of 120 degrees
%in the anticlockwise direction.
a=pol2cart(1,((pi/180)*120));
%If Va1,Vb1 and Vc1 are the positive sequence component of the unbalanced
%voltages,
Vb1=a^2*Va1;
%If Va2,Vb2 and Vc2 are the negative sequence component of the unbalanced
%voltages
Vb2=a*Va2;
%If Va0,Vb0 and Vc0 are the negative sequence component of the unbalanced

%voltages
Vb0=Va0;
Vc0=Va0;
Vc1=a* Va1;
Vc2=a^2*Va2;
Vb=Vb1+Vb2+Vb0;
Vc= Vc1+ Vc2+Vc0;
Va=0;

% P.U values
%put values of line voltages'
Vab=Va-Vb;
Vab_mag = abs(Vab);

Vca=Vc-Va;
```

```
Vca_mag = abs(Vca);

Vbc=Vb-Vc;
Vbc_mag = abs(Vbc);

%assuming a base voltage value of 22kv...V_pu = (V_actual/V_base)

% Actual values
%actual values of line voltages
V_base = 22000;

Vab_actual = V_base * Vab_mag

Vbc_actual = V_base * Vbc_mag

Vca_actual = V_base * Vca_mag
```

```
Vab_actual =

   2.5199e+03


Vbc_actual =

   3.7444e+03


Vca_actual =

   1.2246e+03
```

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