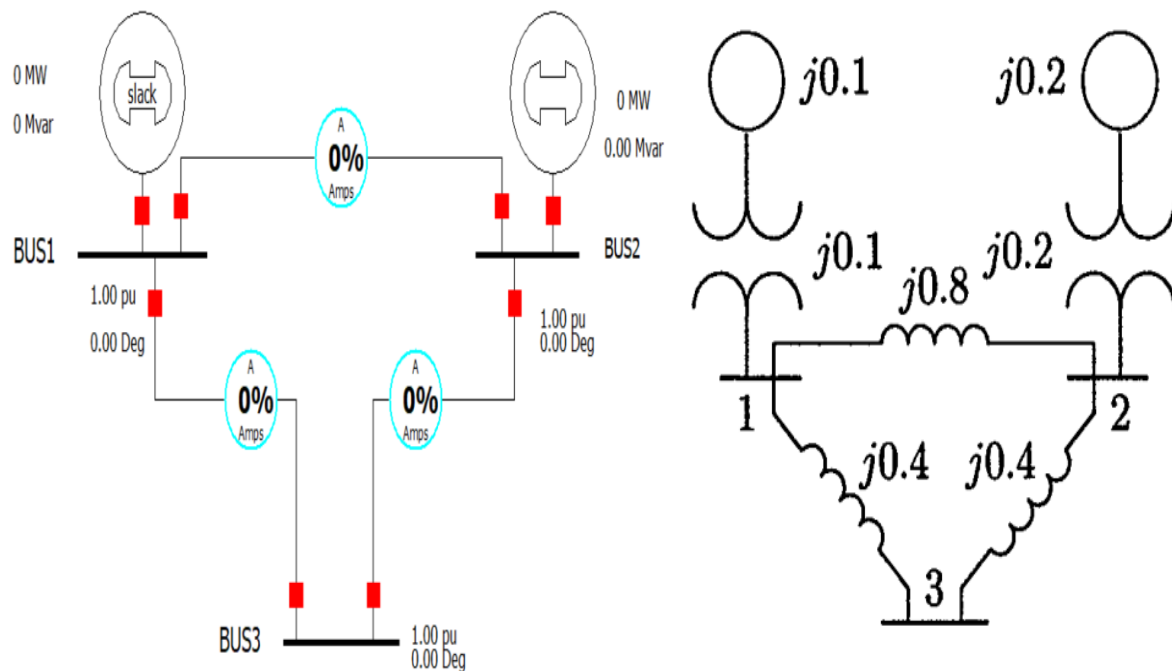


### **Problem 1:(Fault occurs in BUS 3)**



**Figuer1: Fault Analysis problem 1**

# Determine the fault current, the bus voltages, the bus voltages, and the line currents during the fault when a balanced three-phase fault with a fault impedance  $Z_f=0.16$  per unit occurs on.

### **Experimental data table:**

**At  $Z_f=0.0$  ohm**

Number	Name	Phase Volt A	Phase Volt B	Phase Volt C	Phase Ang A	Phase Ang B	Phase Ang C
1	BUS1	0.65723	0.65723	0.65723	2.06	-117.94	122.06
2	BUS2	0.62017	0.62017	0.62017	15.49	-104.51	135.49
3	BUS3	0	0	0	90	90	90

**At  $Z_f=0.16$  ohm**

Number	Name	Phase Volt A	Phase Volt B	Phase Volt C	Phase Ang A	Phase Ang B	Phase Ang C
1	BUS1	0.77333	0.77333	0.77333	2.02	-117.98	122.02
2	BUS2	0.74856	0.74856	0.74856	9.5	-110.5	129.5
3	BUS3	0.33748	0.33748	0.33748	5.7	-114.3	125.7

**Fault Current,Subtransient phase Current(p.u,deg):**

CalculateClearClear/Close

Choose the Faulted Bus

Sort by ☐ Name ☒ Number

1 (BUS1) [138.0 kV]

2 (BUS2) [138.0 kV]

3 (BUS3) [138.0 kV]

Fault Location

☒ Bus Fault

☐ In-Line Fault

Fault Type

☐ Single Line-to-Ground

☐ Line-to-Line

☒ 3 Phase Balanced

☐ Double Line-to-Ground

Location %

0

Fault Impedance

R : 0.00000

X : 0.16

Fault Current

Scale Current By: 1.00000

If Magnitude: 2.109 p.u.

If Scaled Mag: 2.109 p.u.

If Angle: -84.30 deg.

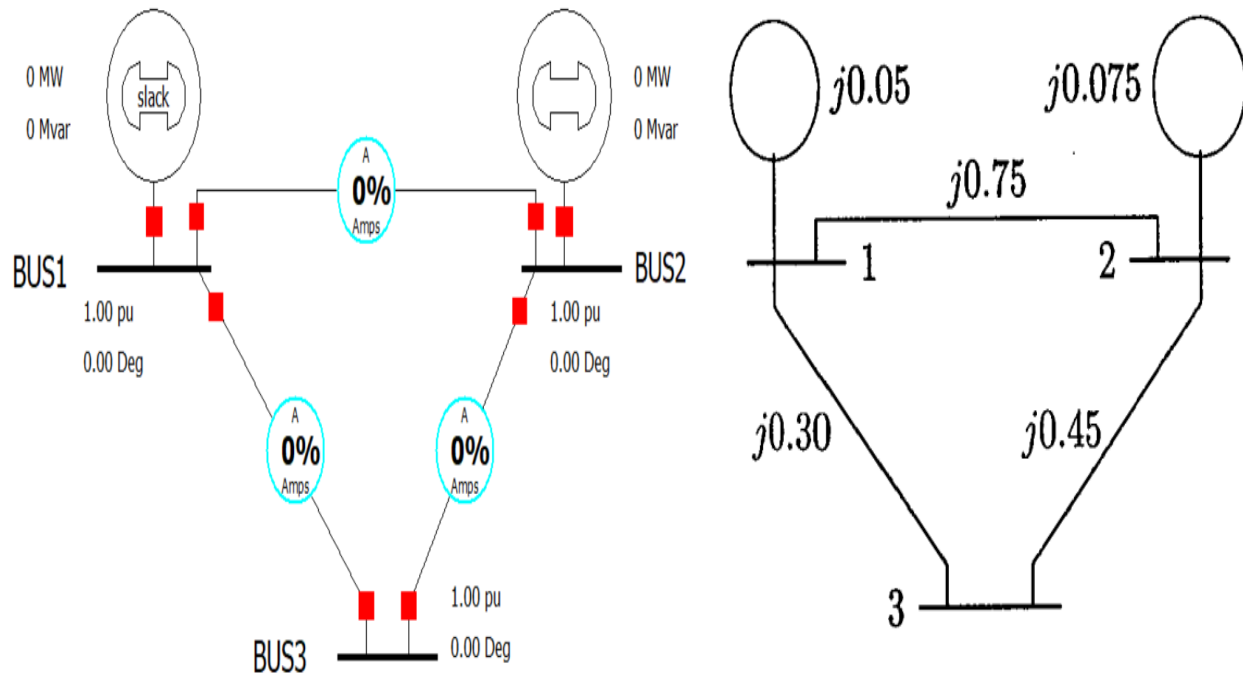
Units

☒ p.u. ☐ Amos

Subtransient Phase Current

	p.u.	deg.
A	2.109	-84.30
B	2.109	155.70
C	2.109	35.70

## **Problem 2:(Fault occurs in BUS 3)**



**Figurer 2:** Fault Analysis problem 2

# Determine the fault current, the bus voltages, the bus voltages, and the line currents during the fault when a balanced three-phase fault with a fault impedance  $Z_f = 0.19$  per unit occurs on.

### **Experimental data table:**

**At  $Z_f = 0.0$  ohm**

Number	Name	Phase Volt A	Phase Volt B	Phase Volt C	Phase Ang A	Phase Ang B	Phase Ang C
1	BUS1	0.75	0.75	0.75	0	-120	120
2	BUS2	0.75	0.75	0.75	0	-120	120
3	BUS3	0	0	0	90	90	90

**At  $Z_f = 0.19 \text{ ohm}$**

Number	Name	Phase Volt A	Phase Volt B	Phase Volt C	Phase Ang A	Phase Ang B	Phase Ang C
1	BUS1	0.86047	0.86047	0.86047	0	-120	120
2	BUS2	0.86047	0.86047	0.86047	0	-120	120
3	BUS3	0.44186	0.44186	0.44186	0	-120	120

**Fault Current, Subtransient phase Current(p.u,deg):**

CalculateClearClear/Close

Choose the Faulted Bus

Sort by ☐ Name ☒ Number

1 (BUS1) [138.0 kV]

2 (BUS2) [138.0 kV]

3 (BUS3) [138.0 kV]

Fault Location

☒ Bus Fault

☐ In-Line Fault

Location %

Fault Impedance

R :

X :

Fault Type

☐ Single Line-to-Ground

☒ 3 Phase Balanced

☐ Line-to-Line

☐ Double Line-to-Ground

Fault Current

Scale Current By:

If Magnitude:  p.u.

If Scaled Mag:  p.u.

If Angle:  deg.

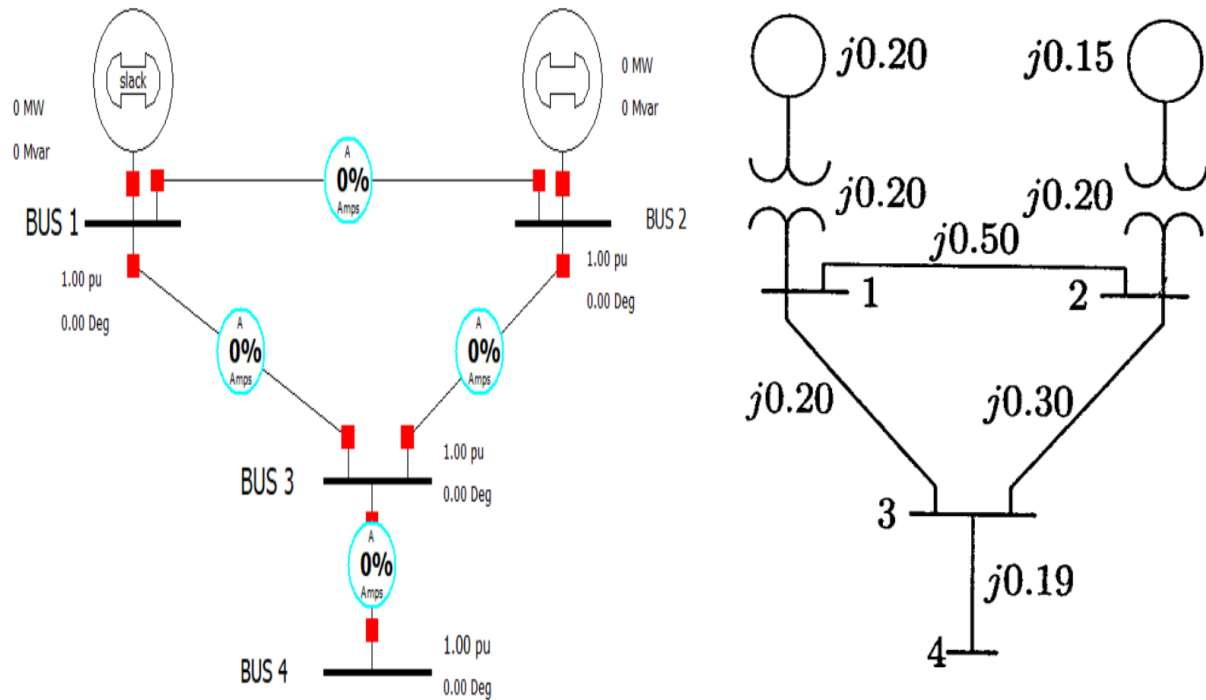
Units

☒ p.u. ☐ Amps

Subtransient Phase Current

	p.u.	deg.
A	<input type="text" value="2.326"/>	<input type="text" value="-90.00"/>
B	<input type="text" value="2.326"/>	<input type="text" value="150.00"/>
C	<input type="text" value="2.326"/>	<input type="text" value="30.00"/>

### **Problem 3:(Fault occurs in BUS 4)**



**Figuer3:** Fault Analysis problem 3

# Determine the fault current, the bus voltages, the bus voltages, and the line currents during the fault when a balanced three-phase fault with a fault impedance  $Z_f=0.16$  per unit occurs on.

### **Experimental data table:**

**At  $Z_f= 0.0$  ohm**

Number	Name	Phase Volt A	Phase Volt B	Phase Volt C	Phase Ang A	Phase Ang B	Phase Ang C
1	BUS 1	0.6	0.6	0.6	0	-120	120
2	BUS 2	0.65	0.65	0.65	0	-120	120
3	BUS 3	0.38	0.38	0.38	0	-120	120
4	BUS 4	0	0	0	90	90	90

**At  $Z_f = 0.0225 \text{ ohm}$**

Number	Name	Phase Volt A	Phase Volt B	Phase Volt C	Phase Ang A	Phase Ang B	Phase Ang C
1	BUS 1	0.60866	0.60866	0.60866	0	-120	120
2	BUS 2	0.64074	0.64074	0.64074	0	-120	120
3	BUS 3	0.38091	0.38091	0.38091	0	-120	120
4	BUS 4	0	0	0	0	-116.57	116.57

**Fault Current, Subtransient phase Current(p.u,deg):**

CalculateClearClear/Close

Choose the Faulted Bus

Sort by ☐ Name ☒ Number

1 (BUS 1) [138.0 kV]

2 (BUS 2) [138.0 kV]

3 (BUS 3) [138.0 kV]

4 (BUS 4) [138.0 kV]

Fault Location

☒ Bus Fault

☐ In-Line Fault

Location %

Fault Impedance

R :

X :

Fault Type

☐ Single Line-to-Ground

☐ Line-to-Line

☒ 3 Phase Balanced

☐ Double Line-to-Ground

Fault Current

Scale Current By:

If Magnitude:  p.u.

If Scaled Mag:  p.u.

If Angle:  deg.

Units

☒ p.u. ☐ Amperes

Subtransient Phase Current

	p.u.	deg.
A	1.914	-90.00
B	1.914	150.00
C	1.914	30.00