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## **Symmetrical Fault Current Calculations Unlv**

Symmetrical fault  
current calculations

The per-unit voltage on  
the high-voltage side of  
the transformer is

120,000 1.044 pu

115,000 actual value V  
pu base value

Thevenin equivalent

circuit:  $V_{th} = 1.044$  pu

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**Symmetrical Fault**

Short circuit current (pu)  $I_{sc}$

$$= V_{th}/Z_{th} = 3.73 \text{ pu}$$

Base current on the  
high voltage side:

$I_{base} = 502 \text{ A}$  Short  
circuit current (A):

### **Symmetrical Fault Current Calculations**

Fault current

calculations using the  
impedance matrix

Therefore, the fault  
current at bus 2 is just  
the prefault voltage  $V_f$   
at bus 2 divided by  $Z$

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22, the driving point  
impedance at bus 2. "

22 f f V I Z The voltage  
differences at each of

the nodes due to the  
fault current can be  
calculated by

substitution: " 12 1 12

22 2" 32 3 32 22" 42 4

42 22 ff ff ff ff Z V Z I V

Z V V V

## **Fault Current Calculations - University of Nevada, Las Vegas**

Symmetrical fault

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current calculations

The per-unit voltage on  
the high-voltage side of  
the transformer is

120,000 1.044 pu

115,000 actual value V  
pu base value

Thevenin equivalent  
circuit:  $V_{th} = 1.044$  pu

$Z_{th} = j0.28$  pu Short  
circuit current (pu)  $I_{sc}$   
 $= V_{th}/Z_{th} = 3.73$  pu

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6 Symmetrical AC  
component of the fault

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current:  $\frac{3}{4}$  There are three periods of time: z Sub-transient period: first cycle or so after the fault - AC current is very large and falls rapidly; z Transient period: current falls at a slower rate; z Steady-state period: current reaches its steady value.  $\frac{3}{4}$  It is possible to determine the time constants for the sub-transient



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### **EE 340 Symmetrical Faults - ee.unlv.edu**

The product of normal voltage and short circuit current at the point of fault is expressed in Short Circuit kVA even though the voltage at the point of fault reduces to very low value (ideally zero).  
Let.  $V$  = Normal System Voltage.  $I$  = Full load current %  $X$  = % impedance up to the point of fault. Then

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short circuit current  $I_{sc}$

$$= I_x(100 / \%X)$$

Therefore,

### **Symmetrical Fault and Short Circuit kVA | Electrical Concepts**

For unbalance conditions the calculation of fault currents is more complex. One method of dealing with this is symmetrical components. Using symmetrical

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components, the unbalance system is broken down in to three separate symmetrical systems: Positive sequence - where the three fields rotate clockwise

## **Fault Calculation - Symmetrical Components**

Symmetrical Negative  
sequence Symmetrical  
. Example  $V_C$   $V_B$  (2)  $V_A$   
 $V_B$  . Transformation  
ABC  $\frac{1}{\sqrt{3}}$   $\frac{1}{\sqrt{3}}$   $\frac{1}{\sqrt{3}}$   $a$   $a$   $a$   $a$

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Symmetrical Fault  
Transformation 612

+11+1 + Cl 2 + al ABC

1 a a . . . .

interconnected only at  
the fault location.

Prefault load current is  
neglected. Because of  
this, the positive  
sequence internal  
voltages of

## **Symmetrical Components and Unsymmetrical Faults**

Symmetrical  
Components, For

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unbalance conditions the calculation of fault currents is more complex. One method of dealing with this is by the use of symmetrical components. In symmetrical components, the unbalance system is broken down in to three separate symmetrical systems, each of which are easily solved.

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## **Fault Calculations - Introduction**

During the first half of a cycle, the fault current is at its largest magnitude - occurring at a moment when the voltage wave (not shown) is passing the reference axis. The asymmetry is brought on by the DC offset (as shown in Figure 1). With this offset, the RMS value of the asymmetrical current is about  $\sim 1.6$  times the

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symmetrical current.

## **What Do Symmetrical, Asymmetrical, Momentary, Interrupting ...**

Important Questions of  
Symmetrical Fault: 1.

What do you  
understand by a short-  
circuit ? Discuss the  
possible causes of  
short-circuit in the  
power. 2. Explain the  
harmful effects of short-  
circuit fault on the

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power system. 3. What is the importance of short-circuit calculations ? 4.

Discuss the possible faults on overhead lines. 5.

### **Important Questions of Symmetrical Fault**

Symmetrical and Asymmetrical Currents in Short Circuit Faults. Short circuit faults may include both symmetrical and asymmetrical



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Symmetrical Fault  
components.

Understanding the  
difference and where  
each type of fault  
current impacts the  
analysis of a worst  
case event is the focus  
of this presentation.  
This refresher webinar,  
taught by Jim Chastain  
at EasyPower ...

## **Symmetrical and Asymmetrical Currents in Short Circuit ...**

6.10. Symmetrical fault

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current: systematic  
approach When it  
comes to fault  
calculations on large  
networks, the Thevenin  
equivalent become  
difficult to obtain,  
especially for the  
impedance . It is  
therefore essential to  
have a systematic  
calculation approach  
that can be  
incorporated into any  
model.

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1,242 KB; Language:  
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1, 2016; Viewed: 1,416

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## **An 6005 Synchronous Buck Mosfet Loss Calculations ...**

Symmetrical short-circuit current: A fault-current whose waveform is symmetrical about the zero axis. In other words, the positive peak current has the same value as the negative peak current. These peak (maxium)

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currents are always equal to 1.414 times the rms symmetrical current.

### **How to perform short-circuit calculations. | EC&M**

This 6-hour virtual training is designed for engineers and technicians involved with protective relaying. Knowledge of fault current including symmetrical components is a must

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for protection engineers and engineers involved with engineers who specify electrical equipment. Any analysis of system events involving protective relaying requires a sound knowledge of fault analysis.

## **Fault Calculations & Symmetrical Components - Doble**

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current transients in  
synchronous

generators When a  
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**Fault In Our Stars**

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## **(PDF) Symmetrical Fault Calculations | jerrico reynoso ...**

It means that the protective device that we will use must have a short circuit capacity of more than 20 KA. It will help the Over Current Protective



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device (OCPD) to safely interrupt this amount of fault current. This blog has just provided you a basic idea of how we will calculate the amount of short circuit current for a small power system.

### **Simple Method for Basic Short Circuit Current Calculations**

Where,  $I_f$  is the total three phase fault current,  $v$  is the phase to neutral voltage  $z_1$  is

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the total positive sequence impedance of the system; assuming that in the calculation, impedances are represented in ohms on a voltage base.. Symmetrical Component Analysis.

The above fault calculation is made on assumption of three phase balanced system. The calculation is made for one phase only as the ...

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