SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

An Autonomous Institution

Accredited by NAAC – UGC with 'A' Grade

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

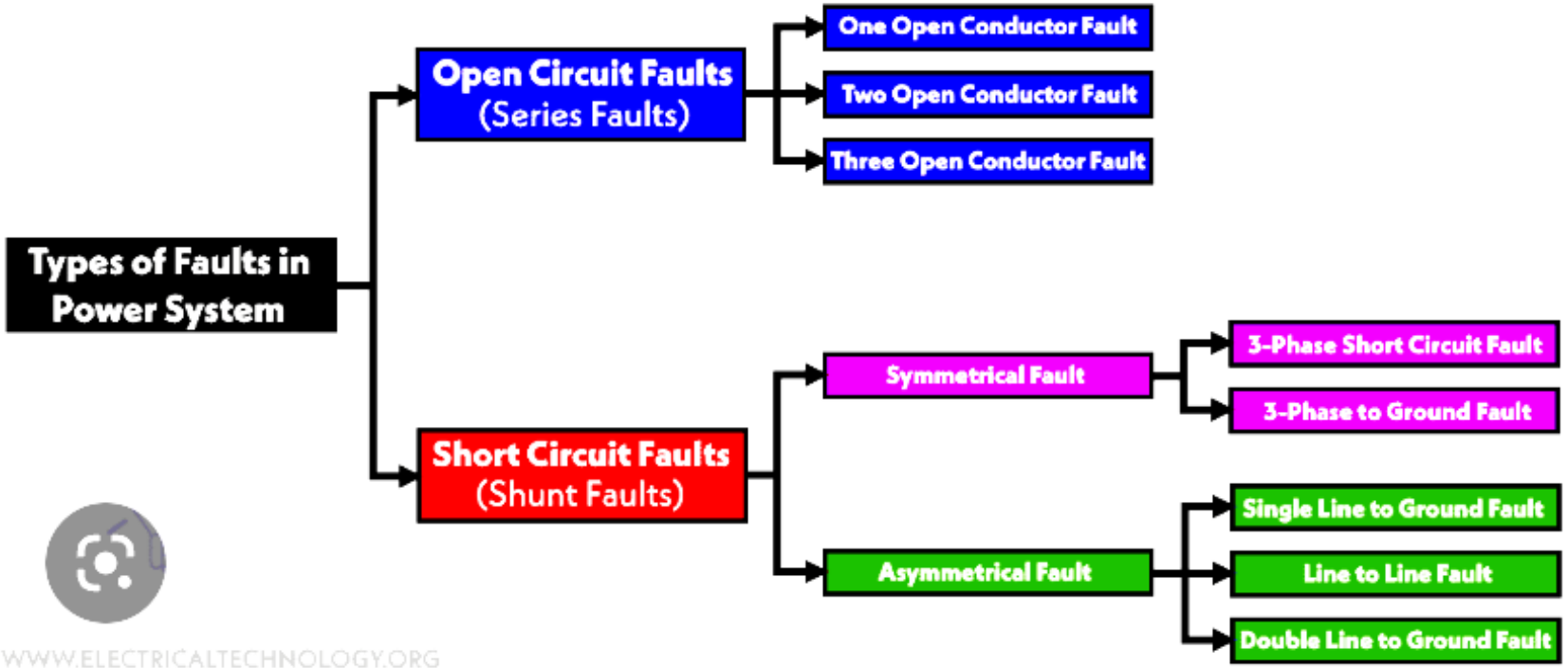
COURSE NAME : 19EE605 – PROTECTION & SWITCH GEAR

III YEAR /VI SEMESTER EEE

Unit 1 – Protection Schemes

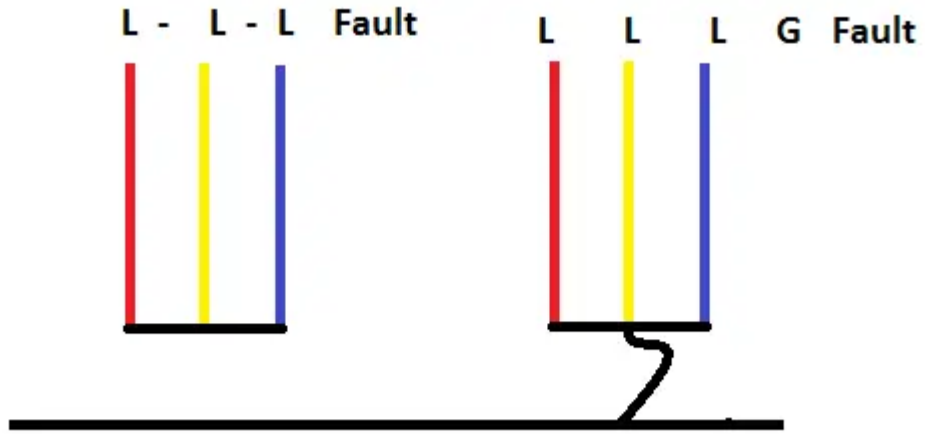
Topic-Types of Faults

TYPES OF FAULTS



SYMMETRICAL FAULT

A three-phase fault is called a symmetrical type of fault. In a 3 ph fault, all the three phases are short circuited. There may be two situations—all the three phases may be short circuited to the ground or they may be short-circuited without involving the ground.



UNSYMMETRICAL FAULT

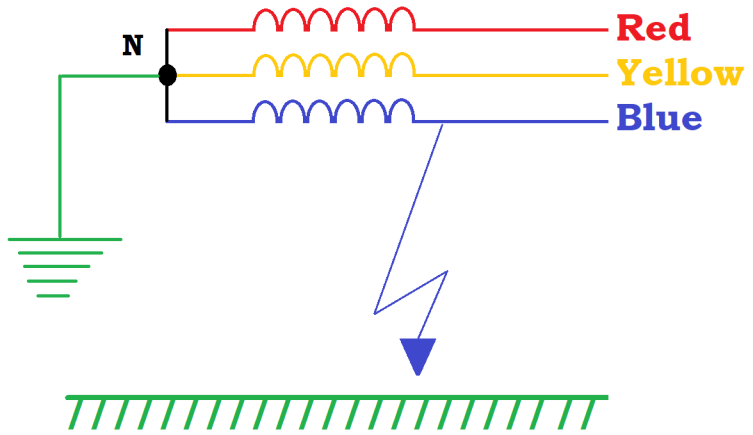
- Single line-to-ground fault (LG)– In single line-to-ground fault, one conductor comes in contact with the ground or the neutral conductor. Single line to ground fault is the most frequently occurring fault (60 to 75% of occurrence)

- Line-to-line fault (LL)– A line-to-line fault occurs when two conductors are short circuited. This type of fault occurrence ranges from 5 to 15%.

- Double Line-to-ground fault (LLG)– A double ground fault occurs when two conductors fall on the ground or come in contact with the neutral conductor. This type of fault occurrence ranges from 15 to 25% of occurrence

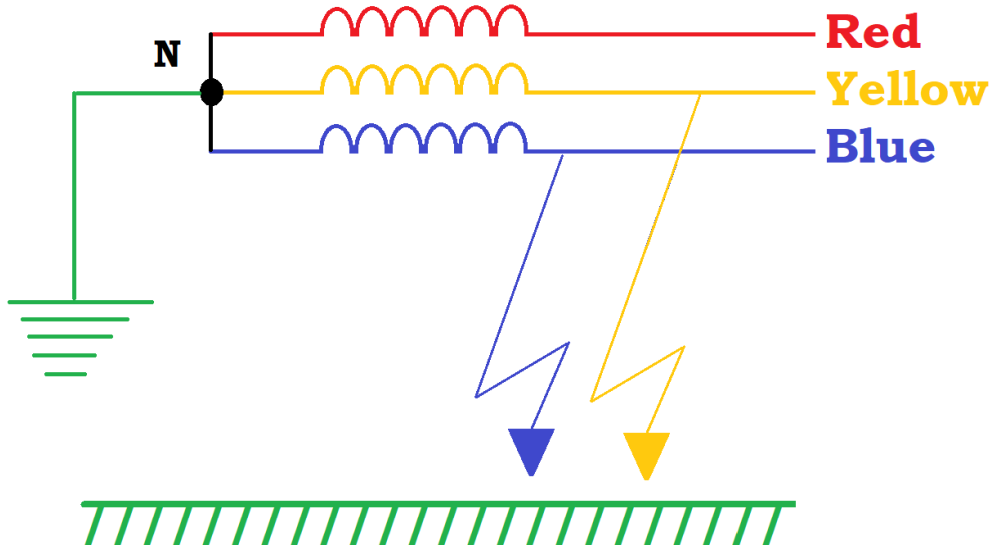
SINGLE LINE TO GROUND FAULT

The single phase-to-ground fault is usually referred as “short circuit” fault and occurs when one conductor falls to ground. When a fault occurs on a distribution line, it is very important to identify the fault location as quickly as possible so as to restore power as soon as possible.



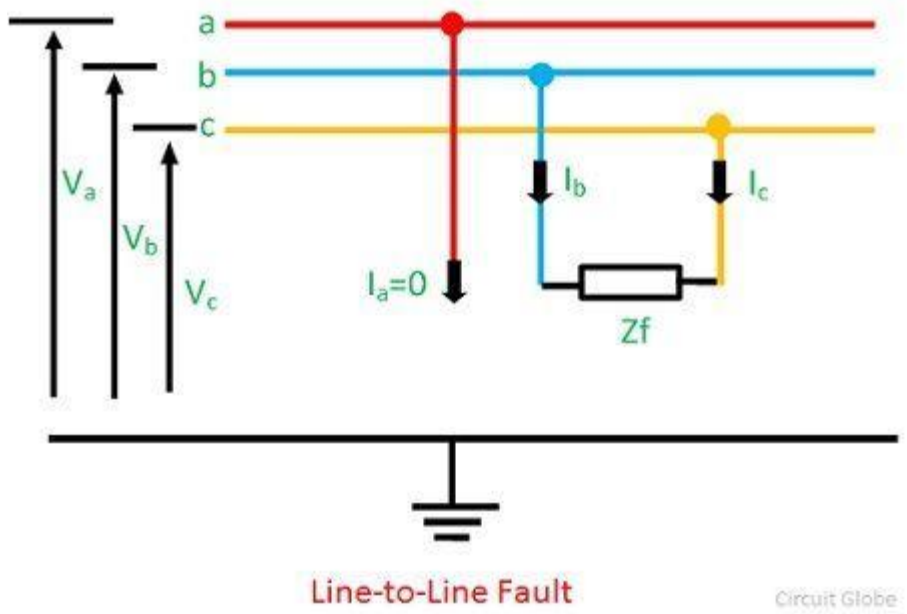
DOUBLE LINE TO GROUND FAULT

A double line-to-ground fault occurs when two conductors fall on the ground or come in contact with the neutral conductor. This type of fault occurrence ranges from 15 to 25% of occurrence



LINE TO LINE FAULT

Line-to-line fault (LL)– A line-to-line fault occurs when two conductors are short circuited. This type of fault occurrence ranges from 5 to 15%.



FAULT STATISTICS

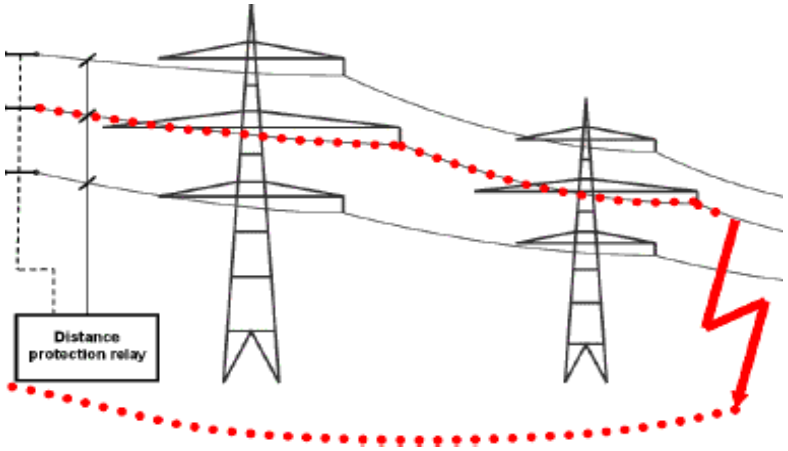
% of Total Faults

Overhead Lines	50
Underground Cables	9
Transformers	10
Generators	7
Switchgears	12
CTs, VTs, Relays	
Control Equipment, etc.	12

Types of Faults	Fault Symbol	% of Total Faults
Line to Ground	L-G	85
Line to Line	L-L	8
Double Line to Ground	2L-G	5
Three Phase	3-f	2

ASSESSMENT 1

Mention the fault shown in the picture



a) Line to Line
(b) Line to Ground
(c) Line to Line to Ground
(d) Ground to Ground

REFERENCES

1.BadriRam , Vishwakarma, B.H., “Power System Protection and Switchgear”, New Age International Pvt Ltd Publishers, 2 nd Edition 2017.

2. Ravindranath, B., Chander, M., “Power system Protection and Switch gear”, 2nd Edition, New Age International, 2016

3. Soni M.L., Gupta P.V., Bhatnagar U.S., Chakrabarthi A., “A Text Book on Power System Engineering”, Dhanpat Rai & Sons Company Private Limited, New Delhi,2008

4. Sunil S.Rao, “Switchgear, Protection and Power System (Theory, Practice & Solved Problems)”, Khanna publishers, New Delhi, 2019.

5.Paithankar, Y.G., Bhide, S.R., “Fundamentals of Power System Protection”, Prentice Hall of India Pvt. Ltd., New Delhi, 2nd Edition, 2014.

THANK YOU