SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

An Autonomous Institution

Accredited by NBA – AICTE and 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 AND SWITCHGEAR

III YEAR /VI SEMESTER

Unit 1- PROTECTION SCHEMES

BASIC RELAY TERMINOLOGY

- **Relay**: A relay is an automatic device by means of which an electrical circuit is indirectly controlled (opened or closed) and is governed by a change in the same or another electrical circuit.
- **Protective relay**: A protective relay is an automatic device which detects an abnormal condition in an electrical circuit and causes a circuit breaker to isolate the faulty element of the system. In some cases it may give an alarm or visible indication to alert operator.
- **Operating force or torque**: A force or torque which tends to close the contacts of the relay.
- **Restraining force or torque:** A force or torque which opposes the operating force/ torque.

- **Actuating quantity**: An electrical quantity (current, voltage, etc) to which relay responds.
- **Pick-up (level):** The threshold value of the actuating quantity (current, voltage, etc.) above which the relay operates.
- **Reset on drop-out (level)**: The threshold value of the actuating quantity (current, voltage, etc.) below which the relay is de-energised and returns to its normal position or state.
- **Operating time**: It is the time which elapses from the instant at which the actuating quantity exceeds the relays pick-up value to the instant at which the relay closes its contacts.
- **Reset time**: It is the time which elapses from the moment the actuating quantity falls below its reset value to the instant when the relay comes back to its normal (initial) position.

Breaker Back-up

- **Back-up relay**: A back-up relay operates after a slight delay, if the main relay fails to operate.
- **Back-up protection**: The back-up protection is designed to clear the fault if the primary protection fails. It acts as a second line of defence.
- **Primary protection**: If a fault occurs, it is the duty of the primary protective scheme to clear the fault. It acts as a first line of defence. If it fails, the back-up protection clears the fault.
- **Burden**: The power consumed by the relay circuitry at the rated current is known as its burden.

References

1. SuniS Rao, “Switchgear, Protection and Power System (Theory, Practice & Solved Problems)”, Khanna Publishers, New Delhi, 2019.

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

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

Thank You