

### 3.2 Types Distribution Cable:

- Generally, distribution cables are designated according to the nominal system voltage on which they are intended to operate.
- The standard system voltages used in the UK are 1.9/3.3kV, 3.8/6.6kV, 6.35/11kV, 12.7/22kV and 19/33kV.
- Cables are also manufactured for use on 8.7/15 kV systems for the export market.
- The design of these cables is dictated by the mechanical rigours associated with their installation conditions and not simply by their electrical duty.
- Under normal operating conditions, the ratio of some systems designed to enable continued operation with a fault to earth on one phase, the voltage on the two sound phases will rise towards the phase-to-phase voltage

#### Category A:

- Where earth faults are cleared as rapidly as possible but in any case within one minute.

#### Category B:

- This category comprises those systems which, under fault conditions, are operated for a short time only with one phase earthed. This period should, in general, not exceed 1 hour, but a longer period can be tolerated as specified in the relevant cable standard.

#### Category C:

- This category comprises all systems which do not fall into categories A or B.
- In addition, the cable standards recommend cables of the same nominal voltage ratings for both category A and B systems.
- In most cable standards, the period for which cables are allowed to operate under category B conditions is extended up to 8 hours on any single occasion.
- When cables are expected to operate for longer periods with one phase earthed, cables of the next voltage higher should be specified, thus effectively increasing the insulation between phase conductor and earth.
- For paper insulated cables of the belted type, it is necessary only to increase the thickness of belt insulation to cater for category C systems.
- Designs are therefore provided for category C systems with voltage designations of 3.3/3.3 kV, 6.6/6.6 kV and 8.7/11 kV. The value of 8.7kV for the belted 11 kV category C system is chosen to provide consistency with the U<sub>0</sub> value for screened 8.7/15 kV cables.

### Design and Applications

#### 22 kV and 33 kV cables

- 33 kV cables are widely used for distribution in public supply systems.
- XLPE insulated cables have had increasing use as an alternative to paper insulated types.
- The use of 22 kV cables for distribution in public supply is confined to the north-east they are used 33 kV cables used elsewhere.

### 11 kV and 15kV cables

- 11 kV is the main distribution voltage between 240/415V and 33kV.
- Although 6.6kV systems were once common they have now largely been converted to 11 kV.
- The corresponding single-core cable, generally un-armoured, was used for short interconnectors or for very high currents requiring large conductors.

