

WESTINGHOUSE
 TYPE HZM DISTANCE RELAY
 SUPPLEMENTARY INSTRUCTION FOR SINGLE POLE OR
 SELECTIVE POLE CARRIER RELAYING

These instructions are supplementary to those in I.L. 41-412 or I.L. 41-412.1 for the application of the type HZM relay in the Single Pole or Selective Pole Carrier Relaying Scheme.

Delta current is normally used to energize the directional and impedance elements, as explained in the section under Connections. This connection is not suitable for single or selective pole tripping because the delta current may operate two relays on single line-to-ground faults and trip an incorrect number of phases. Consequently all the impedance and the directional elements of the type HZM relay are connected to receive star current and delta voltage from the line current and potential transformers.

As a result of the star connections, the settings of the type HZM relay as described in the instruction leaflet should be modified as follows:

1. The impedance element should be set using the formula:

$$TS = \frac{17.3 Z_0 R_c}{R_v}$$

In other words the constant should be 17.3 instead of 10 when using star current. Delta current is supplied to the auxiliary unit in the conventional manner and hence the settings and operation as described in the I.L. are correct.

2. To decrease the possibility of the first element overreaching on external double-line-to-ground faults, it is recommended that Z_1 be set for 50 to 60% of the protected line section instead of 80 to 90%. The settings for Z_2 and Z_3 should be made as previously recommended.

Some of the auxiliary boxes used with the type HZM relay may be marked:

0- 1.5 - 3.0 - 4.5 - 6.0
 0- .3 - .6 - .9 - 1.2

Actually these markings on the box should be:

0 - 1.9 - 3.7 - 5.6 - 7.5
 0 - .37 - .75 - 1.1 - 1.5

As given in the instruction leaflet, the lower values were on the basis of an attempt to average out the variations in the ohm reach of the relay because of its non-linear impedance curve. Practical experience has indicated that the higher values are more typical of actual operating conditions. In any event it is recommended that the relay and box be set for a balance point corresponding to the actual current, voltage and phase angle it will receive during actual faults.

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