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## **TRIP RELAYS**

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### **PURPOSE AND SCOPE**

The Technical Specifications for all new plant, equipment, apparatus and services, for use on the National Grid UK Electricity Transmission system are contained in a three level hierarchy of documents. Level 1 covers ratings and general requirements, Level 2 covers major plant categories and Level 3 covers specific related plant functions.

This document is a Level 3 specification, which describes the functional and performance requirements for trip relays to be used in conjunction with protection schemes at 400kV, 275kV & 132kV switching stations.

### **PART 1 – GENERAL REQUIREMENTS**

#### **1 FUNCTIONAL REQUIREMENTS**

A trip relay (an all-or-nothing relay) as specified in Section 2.2 shall normally be supplied as the trip output stage of all protection systems specified under TS 2.24 and, where latched and electrically reset, these trip relays shall be provided with an associated automatic electrical resetting system as detailed in TS 3.24.75.

##### **1.1 Trip Relays**

Trip relays shall be provided for one or more of the following functions:-

- Increased contact rating
- Contact multiplication
- Trip pulse extension

The trip relay is required to provide fast simultaneous signals to the circuit breaker(s) and all associated protection & control systems that require initiation following a trip operation of a protection system. This shall be achieved by the provision of multiple high speed tripping contacts.

Trip relays supplied shall be either electrically reset latching or self resetting.

## 1.2 Electrically Reset Latching

These shall be electrically operated, electrically reset relays, latching in the operated position. Where the trip relay coils are short term rated, or the operating current of the relay exceeds the break duty of the protection initiating contact, then the trip relay shall be fitted with cut off contacts to reduce the power consumption to an acceptable level.

It shall not be possible to simultaneously energise the operating coil(s) and reset coil(s).

These relays shall be provided for applications requiring trip pulse extension, the trip relay remaining in the operated state after the initiating protection has reset, until such time as the trip relay is reset from an associated automatic resetting scheme after a pre-determined time delay.

## 1.3 Self Reset

These shall be electrically operated, self reset, non latching relays. Where the trip relay coils are short term rated, or the operating current of the relay exceeds the break duty of the protection initiating contact, then the trip relay shall be fitted with an 'economy' feature to reduce the power consumption to an acceptable level.

These relays shall be provided for applications where the trip relay is required to follow the protection operation, the trip relay self resetting when the protection resets.

Each of the above trip relay types can be categorised into two rating classes

## 1.4 Low Burden

These shall comply with the performance requirements specified in Section 2 and shall normally be utilised for tripping applications with double pole switched trip initiations. The design of these relays should make provision for double pole switching of the operate coil.

Trip relays may be a single relay device or may comprise one or more devices, components, or elements in combination to provide the overall function of a trip relay.

All trip relays shall be fitted with a hand reset operation indicator.

The choice of trip relay type and rating (latching, self reset, high or low burden, economy, single or double pole switched), the total number of trip relay contacts, and the contact sense, will depend on the specific protection system to which it is being applied and is to be determined by the supplier unless otherwise specified under the contract.

## 1.5 High Burden

These shall comply with the performance requirements specified in Section 2 and shall normally be utilised for tripping applications with single pole switched trip initiations.

## 1.6 Trip Relay Resetting

Latching trip relays shall be electrically reset by an associated automatic trip relay resetting system. Trip relay automatic resetting systems also provide the interlock for National Grid automatic switching schemes, as defined in TS 3.24.75, by control of the trip output pulse duration. Typical logic arrangements of the interconnections of trip relay resetting systems with associated plant, equipment and protection systems within the substation, are given in TS 3.24.75, Appendix A.