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NEUTRAL EARTHING RESISTORS

PURPOSE AND SCOPE

National Grid (NG) Technical Specifications form part of a suite of documents which define National Grid's functional and performance requirements for new plant and equipment used on the NG Electricity Transmission system.

This specification defines the requirements for Neutral Earthing Resistors for direct connection at 66kV and below.

PART 1 – PROCEDURAL

1 GENERAL REQUIREMENTS

1.1 Neutral Earthing Resistors (NER) shall be designed, manufactured and tested in accordance with the latest revisions of IEEE32 except where stated. Devices conforming to this standard shall be of the High Voltage, Low Resistance, Dry type with a minimum operating life of 40 years including all component parts.

1.2 Resistor elements shall be of low temperature coefficient, resistor grade stainless steel material capable of carrying the rated current for the rated time without exceeding the permissible temperature rise limits specified in IEEE32. The connection arrangements for each of the resistor elements shall be such as to allow suitable access for maintenance and for the replacement of any failed resistor element.

Informative: The type of element to be used in the construction of the resistor bank is not defined in this document but elements formed from oval edge wound coils or grids are preferred to enable a more compact design to be realised.

1.3 The resistor bank comprising resistor elements, support frames and terminal connections shall be housed within an enclosure with bolt on side and sloping top covers. The enclosure shall be suitable for outdoor use to provide a degree of protection conforming to IP23 of BS EN 60529. Enclosures shall be fabricated from natural finish stainless steel material, with removable, bolted end covers to allow suitable access for periodic maintenance of the resistor assembly. The frame of the enclosure shall be constructed from galvanised welded or bolted structural steel sections to resist corrosion. Glazed, ceramic insulation material shall be used throughout for all bushings, base and standoff insulators.

1.4 Separate terminals shall be provided to effectively earth bond the enclosure and the resistor to the substation earthing system. Three external connections are required, two for earthing of the enclosure and one for earthing of the resistor. The enclosure earth terminals shall consist of two threaded studs with each stud mounted on diagonally opposite sides of the enclosure. The resistor earth terminal shall be supplied in the form of a bushing with an assigned insulation level of 1.2kV or greater.

The resistor earth terminal shall be positioned adjacent to one of the enclosure earth terminals and shall be provided with a shorting link connected across the terminals. The link shall be removable to allow for testing of the resistor bank and shall be housed within an open cover for mechanical protection.