

DISCONNECTING CIRCUIT-BREAKERS

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PURPOSE AND SCOPE

This document defines the technical requirements for disconnecting circuit-breakers connected to the National Grid Electricity Transmission system at 400kV, 275kV, 132kV, 66kV or 13kV. The principles of this document also apply to equipment which may be connected at other primary voltages.

PART 1 – PROCEDURAL

1 GENERAL REQUIREMENTS

1.1 General Requirements for Disconnecting Circuit-Breakers

- 1.1.1 Disconnecting circuit-breakers shall comply with the requirements of TS 3.2.1 (circuit-breakers) and IEC 62271-108 (disconnecting circuit-breakers)
- 1.1.2 Disconnecting circuit-breakers shall comply with all relevant requirements of TS 3.2.2 (disconnectors and earthing switches), TS 2.2 (switchgear), TS 2.1 (substations) and TS 2.19 (ancillary light current equipment).
- 1.1.3 Disconnecting circuit-breakers shall be provided with reliable position indicating device for the primary disconnecting contacts, tested in accordance with IEC 62271-102, Annexe A.
- 1.1.4 Means shall be provided to verify the correct operation of all alarms which indicate the state (falling, low etc) of pressurised gaseous insulation which is intended to provide safety isolation. It shall not be necessary to reduce the pressure in the main gas volume to verify alarm operation.
- 1.1.5 Provision for checking primary insulating gas monitoring devices shall be achieved in such a way that operation of as much of the alarm circuit as is reasonably practicable be confirmed. Safe access for performing this check shall be provided.

Informative: For disconnector gas compartments this check must be performed to confirm integrity of a 'point of isolation' during switching to achieve safety from the system.

Informative: It will always be practicable to provide a facility to reduce the SF6 pressure at the primary sensor. Any design proposal that does not allow for testing from this point must therefore be justified on the basis of reduced costs and a low probability of failure of the untested elements.

Informative: Where the primary sensor is a transducer, then a good case can generally be made that testing from the input terminals of the monitoring unit is adequate on the grounds that any credible transducer failure would initiate an alarm condition.

- 1.1.6 The status of primary insulation gas monitoring alarms, and any change thereof, shall be clearly indicated at the installed position of the disconnecting circuit-breaker.

- 1.1.7 External insulation which bridges the isolating distance shall be composite polymeric in nature and meet the relevant requirements of TS 3.1.7 (substation polymeric and ceramic insulation).
- 1.1.8 In the case of multi-gap designs there shall be no grading capacitors bridging the isolating distance.
- 1.1.9 Planned, routine maintenance requiring access to the primary high voltage parts of the disconnecting circuit-breaker shall be minimised. A minimum interval for such access shall be 20 years or 3000 mechanical operations.
- 1.1.10 Maximised use shall be made of diagnostics & maintenance which can be employed from ground level without high voltage isolation and earthing of the device. As a minimum, it shall be possible to measure the disconnecting circuit-breaker operating travel characteristic (travel curve) without the need for primary isolation, secondary isolation or the removal of covers resulting in access to hazardous parts.

2 FORMS AND RECORDS

Not applicable.

PART 2 - DEFINITIONS AND DOCUMENT HISTORY

3 DEFINITIONS

Not applicable.

4 AMENDMENTS RECORD

Issue	Date	Summary of Changes / Reasons	Author(s)	Approved By (Inc. Job Title)
1	May 2014	New document	Mark Waldron Network Engineering (Policy)	Jon Fenn Network Engineering Manager

5 IMPLEMENTATION

5.1 Audience Awareness

Audience	Purpose Compliance (C) / Awareness (A)	Notification Method Memo / letter / fax / email / team brief / other (specify)
Construction (Technical Assurance)	Compliance	Document update notification
Network Engineering	Awareness	Document update notification
ETAM Operations	Awareness	Document update notification
Investment Management	Awareness	Document update notification
Market Operations	Awareness	Document update notification