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Engineering Recommendation P18

Issue 2 2019

Complexity of 132 kV circuits

PUBLISHING AND COPYRIGHT INFORMATION

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Amendments since publication

Issue	Date	Amendment
Issue 1	1978	First published
Issue 2	February, 2019	Cosmetic revision to align with the latest ENA Engineering Document template and clarification of definitions. Opportunity has been taken to clarify the interpretation of certain requirements. This issue does not include any principal technical changes.

Contents

Foreword

This Engineering Recommendation (EREC) is published by the Energy Networks Association (ENA) and comes into effect from the date of publication. It has been prepared under the authority of the ENA Engineering Policy and Standards Manager and has been approved for publication by the ENA Electricity Networks and Futures Group (ENFG). The approved abbreviated title of this engineering document is “EREC P18”, which replaces the previously used abbreviation “ER P18”.

This issue replaces and supersedes ER P18 Issue 1 1978.

Issue 1 of this EREC was developed from CEGB Transmission Plant Standard No 13/1 (System Design) Issue 'A', dated 26 February 1965, which no longer applies to 132 kV circuits.

EREC P18 is prescribed in Annex 2 of the Distribution Code [1]. Whilst it has a material effect on Users[1], it does not implement any Distribution Code requirements and does not form part of the Distribution Code technical requirements.

The limits and technical requirements in this EREC have been reviewed and have not materially changed from the previous issue.

This EREC is intended primarily for those tasked with design of 132 kV circuits connected to licensed distribution networks operated by DNOs. These requirements might also be useful information for ENAMC operational personnel.

Where the term “shall” or “must” is used in this document it means the requirement is mandatory. The term “should” is used to express a recommendation. The term “may” is used to express permission.

NOTE: Commentary, explanation and general informative material is presented in smaller type, and does not constitute a normative element.

[1] As defined in the Distribution Code [1].

1 Scope

This EREC sets out the normal limits of complexity of 132 kV circuits by stipulating certain restrictions to be applied to them when they are designed.

It applies irrespectively of the ownership of the 132 kV circuits and of the purpose for which they are used.

This EREC applies to the design of new and the alteration of existing 132 kV circuits.

2 Normative references

Not applicable.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
circuit-breaker
mechanical switching device, capable of making, carrying and breaking currents under normal circuit conditions and also making, carrying for a specified duration and breaking currents under specified abnormal circuit conditions such as those of short-circuit.

[IEV 441-14-20].

3.2
ENAMC
ENA Member Company

3.3
site
location containing one or more circuit isolating switches and/or one or more circuit-breakers

4 General

The restrictions in this EREC should be regarded as being in general the limits of good planning. The majority of 132 kV circuits do not reach this limit nor will they be expected to do so.

Any proposals which would result in these limits being exceeded should be fully explained and agreed with operational engineers.

Care must be observed in the application of this EREC to "Active Circuits" to ensure that protective gear clearance times and discrimination are satisfactory and that the security of lower voltage connected generation is not unduly prejudiced.

5 Restriction A

5.1 Restriction

The normal operating procedure or protective gear operation for making dead any 132 kV circuit shall not require the opening of more than seven circuit-breakers. These circuit-breakers shall not be located on more than four different sites.

5.2 Interpretations

The circuit-breakers to be counted include all those which connect the circuit to other parts of the system.

In a mesh or similar type substation, two circuit-breakers of the same voltage in the mesh controlling a circuit count as one circuit-breaker.

Where a circuit is controlled by two circuit-breakers which select between main and reserve busbars, these count as one circuit-breaker.

Switching isolators are not regarded as circuit-breakers for the purpose of this restriction.

6 Restriction B

6.1 Restriction

Not more than three transformers shall be banked together on any one circuit at any one site.

6.2 Interpretations

A transformer with two lower voltage windings counts as one transformer.

7 Restriction C

7.1 Restriction

No item of equipment shall have isolating facilities on more than four different sites.

7.2 Interpretations

Isolating facilities will normally be provided by means of circuit-breakers and their associated isolators.

Points of isolation on a circuit within an agreed reasonable walking distance to permit the efficient and effective use of one authorised person only at those points during the release and restoration of the circuit, shall be regarded as being on one site.

NOTE 1: A reasonable walking distance could be considered to be less than 250 m.

EXAMPLE

An example of one site for the purposes of this restriction could be a 132 kV substation compound and a separate 33 kV substation compound that are adjacent to one another.

Switching isolators having a "fault make, load break" capability shall be regarded as circuit-breakers for the purpose of this restriction.

In special circumstances a plain-break normally-open isolator may be counted as an isolating facility for the equipment on either side of it.

EXAMPLE

An example of this is an isolator in the route of a circuit bridging two super-grid zones which would be closed only for emergencies of greater severity than those covered by the security standards for 132 kV planning.

Bibliography

Standards publications

For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050-441, *International Electrotechnical Vocabulary. Switchgear, controlgear and fuses*

Other publications

[1] *The Distribution Code of Licensed Distribution Network Operators of Great Britain*, as amended: www.dcode.org.uk

106

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