



ENERGY  
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**Engineering  
Recommendation P18  
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**Complexity of 132kV Circuits**

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## COMPLEXITY OF 132 KV CIRCUITS

### 1 INTRODUCTION

**1.1** This Engineering Recommendation 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.

**1.2** The Recommendation is developed from CEGB Transmission Plant Standard No 13/1 (System Design) Issue 'A', dated 26 February 1965, which will no longer apply to 132 kV circuits.

### 2 SCOPE

**2.1** The restrictions given below 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.

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

**2.3** Care must be observed in the application of this Recommendation 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.

### 3 RESTRICTION A

**3.1** 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.

#### **3.2** Interpretations

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

**3.2.2** 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.

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

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

#### **4 RESTRICTION B**

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

#### **4.2** Interpretations

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

#### **5 RESTRICTION C**

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

#### **5.2** Interpretations

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

**5.2.2** 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.

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

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