



National Grid

National Grid
Technical
Specification

**DAR Interlocking (Trip
Relay Reset)**

NGTS 3.24.75
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DAR INTERLOCKING (TRIP RELAY RESET)

FOREWORD

This specification is a functional specification within the Substation Information, Control and Protection suite of technical specifications. It shall be called up and applied by appropriate bay level specifications.

1 SCOPE

This specification describes the functional and performance requirements for DAR Interlocking on National Grid's 400, 275 and 132 kV circuits.

2 REFERENCES

NGTS 3.24.4 Hardware Platform

NGTS 3.24.16 Delayed Automatic Reclosure

NGTS 3.24.63 Mesh Automatic Switching

3 DEFINITIONS

DAR	Delayed Automatic Reclosure (auto-reclose)
Start DAR	Event to start auto-reclose sequence(s)
Inhibit DAR	While the state Inhibit DAR is set, the auto-reclose sequence shall be temporarily suspended until Inhibit DAR is reset.
Lockout DAR	When Lockout is set then auto-reclose sequences shall be cancelled.
Persistent Fault	A condition where re-energisation of faulted plant via an auto-reclose sequence is not permitted. For example a transformer fault.
DTT	Direct Transfer Trip – this has conventionally been known as Intertripping.

4 FUNCTIONAL REQUIREMENTS

4.1 All Auto-reclose sequences shall be interlocked to ensure that circuit breakers cannot be automatically reclosed until safe power system conditions exist.

4.2 To ensure that interlock conditions are met, auto-reclose sequences shall be temporarily Inhibited until a safe state exists or Locked-out if a safe condition cannot be achieved.

Informative: Figure 1 shows a scheme overview for an example DAR interlock system.

4.3 The Auto-reclose interlock system shall monitor all required protection, inhibit, lockout and plant position status information and generate all required auto-reclose start, inhibit and lockout conditions.

4.4 The Auto-reclose interlock scheme shall be functionally compatible with the auto-reclose functions as defined in NGTS 3.24.16 Delayed Automatic Reclosure and NGTS 3.24.63 Mesh Automatic Switching.

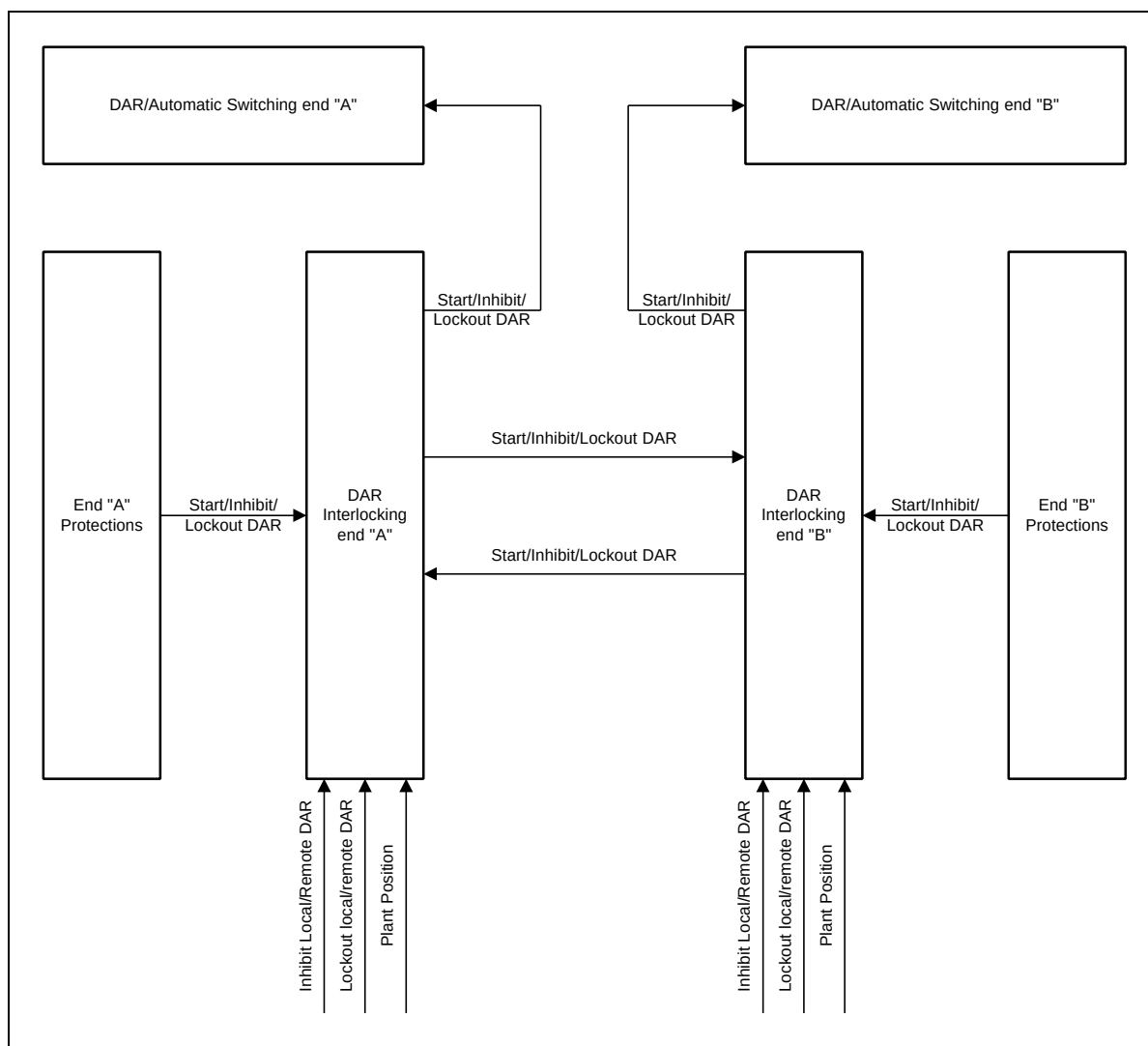


Figure 1: Overview of Auto-reclose Interlocking

Inhibit Auto-reclose

Informative: An inhibited Auto-Reclose sequence is suspended and will not proceed until the inhibit condition is released. An Inhibit Auto-Reclose condition would be established if plant/power system conditions are currently not acceptable for circuit breaker re-closure but it is expected that the condition generating the Inhibit Auto-Reclose requirement will cease within a short period of time (60s).

- 4.5** All associated local and remote Auto-Reclose sequences shall be inhibited until the related power system fault has been cleared as indicated by all protection systems resetting following a power system fault.
- 4.6** Auto-reclose sequences shall be inhibited until all local and received remote inhibit conditions, have been cleared.
- 4.7** Auto-Reclose sequences shall be inhibited for a user defined minimum period of time following the initiating power system fault. This time shall be user settable in the range 0 to 120s. The inhibit condition shall be simultaneously reset at all circuit ends.

Informative: By convention all National Grid three phase Delayed Automatic Reclosure (DAR) sequences are delayed for a minimum period of 10s. This delay allows fault induced swings of generator rotors to stabilise following a power system fault and for any post-fault switching sequences to establish any required auto-reclose inhibit or lockout conditions.