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National Grid

National Grid
Technical
Specification

**Delayed Automatic
Reclosing (DAR)**

NGTS 3.24.16
Issue 1
May 2000

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(National Grid Legal Services. November 1999)

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Registered in
England and Wales
No. 2366977

Published by:

National Grid
Kelvin Avenue
Leatherhead
Surrey KT22 7ST

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DELAYED AUTOMATIC RECLOSING (DAR)

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 single shot three-phase Delayed Automatic Reclosure (DAR) for busbar connected feeder circuits and transformer LV circuit breakers, when the transformer's HV connection is banked/connected to a mesh/busbar corner. Figure 1 illustrates typical applications. National Grid's system operates at 400, 275 and 132 kV.

Informative: The requirements for DAR at Mesh/Single switch stations are covered by NGTS 3.24.63.

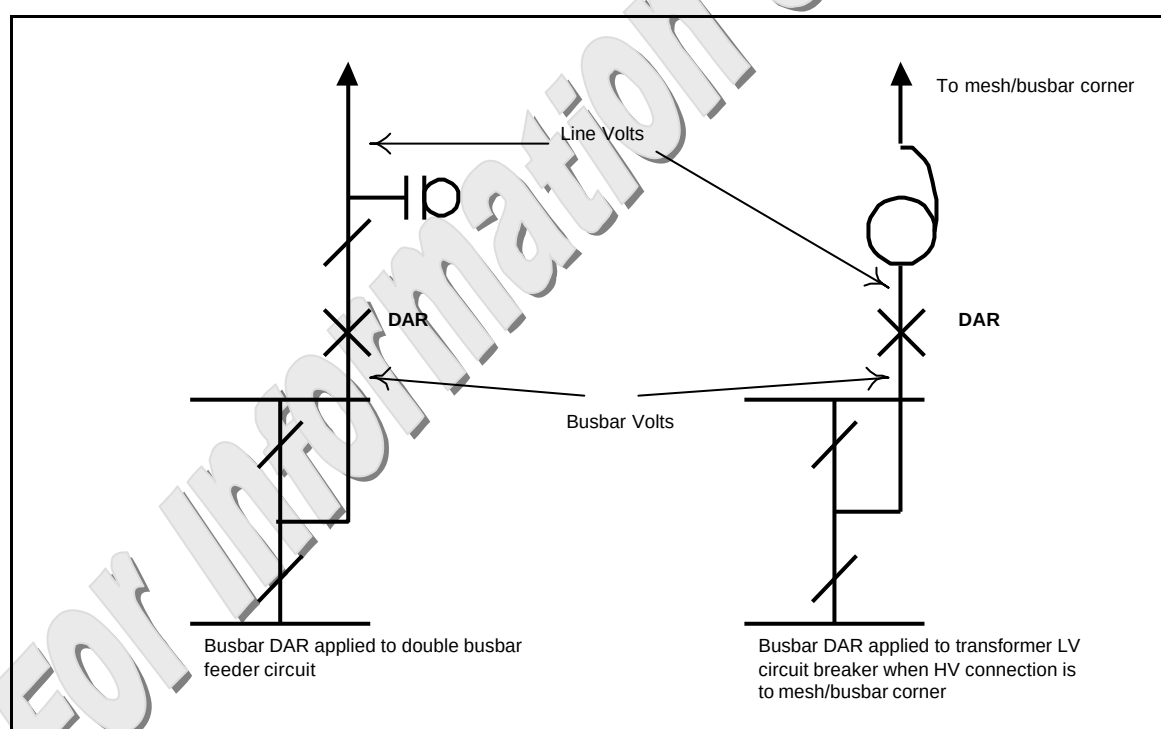


Figure 1: Typical Busbar DAR Applications

2 REFERENCES

NGTS 3.24.4 Hardware Platform

NGTS 3.24.63 Mesh Automatic Switching

NGTS 3.24.75 DAR Conditioning and Interlocks

3 DEFINITIONS

DAR	Delayed Automatic Reclosure
CHECK SYNC	Check Synchronisation
IN SYNC	In Synchronisation

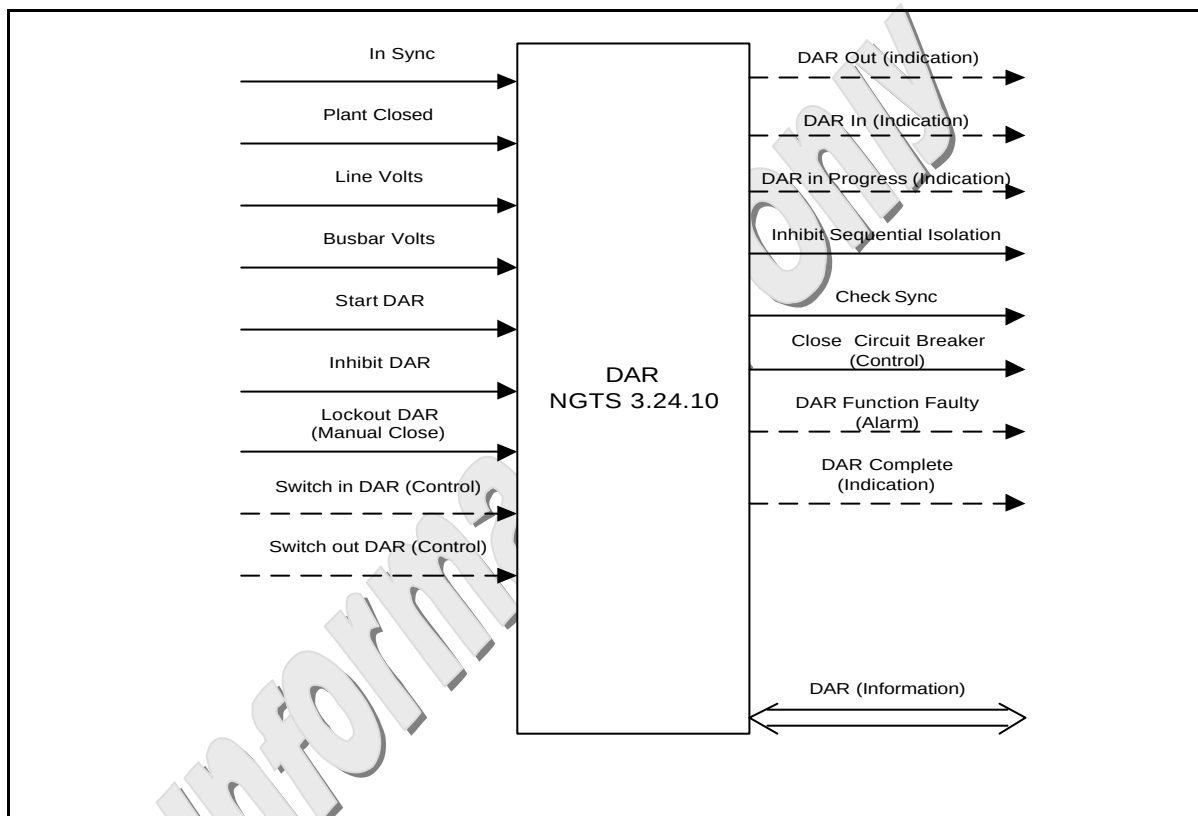


Figure 2: DAR Functional Interfaces

4 FUNCTIONAL REQUIREMENTS

Informative: The automatic switching functionality provided by DAR is a single shot three-phase auto-reclose facility. The DAR will operate in conjunction with external DAR conditioning and interlocks as defined in NGTS 3.24.75.

Informative: This specification defines the required DAR functionality in terms of its operational states, such as DAR in Progress, and conditions/events, such as Inhibit DAR, required to move from one operational state to another. Figure 3 depicts the core DAR operational states with Figure 7 showing support functionality. Functional interface requirements are detailed in Section 5 and Figure 2. To assist cross-referencing between these drawings and the text, transitions between operational states are labelled with a reference of the form (Tn) where n is a unique number.

Start (DAR Function)

Informative: Start (DAR Function) is the Pseudo State occupied prior to the defined functionality becoming operational and therefore represents the starting point for all subsequent operational transitions. The transition from this state would typically occur when the DAR equipment hardware platform is powered-up or re-starting from a function reset condition

- 4.1 The start transitions (T1 - Figure 3) and (T2.1,T3.1 - Figure 6) from the Start State to the operational states DAR out of Service, Line Dead and Busbar Dead respectively shall occur when event DAR Function Started occurs.

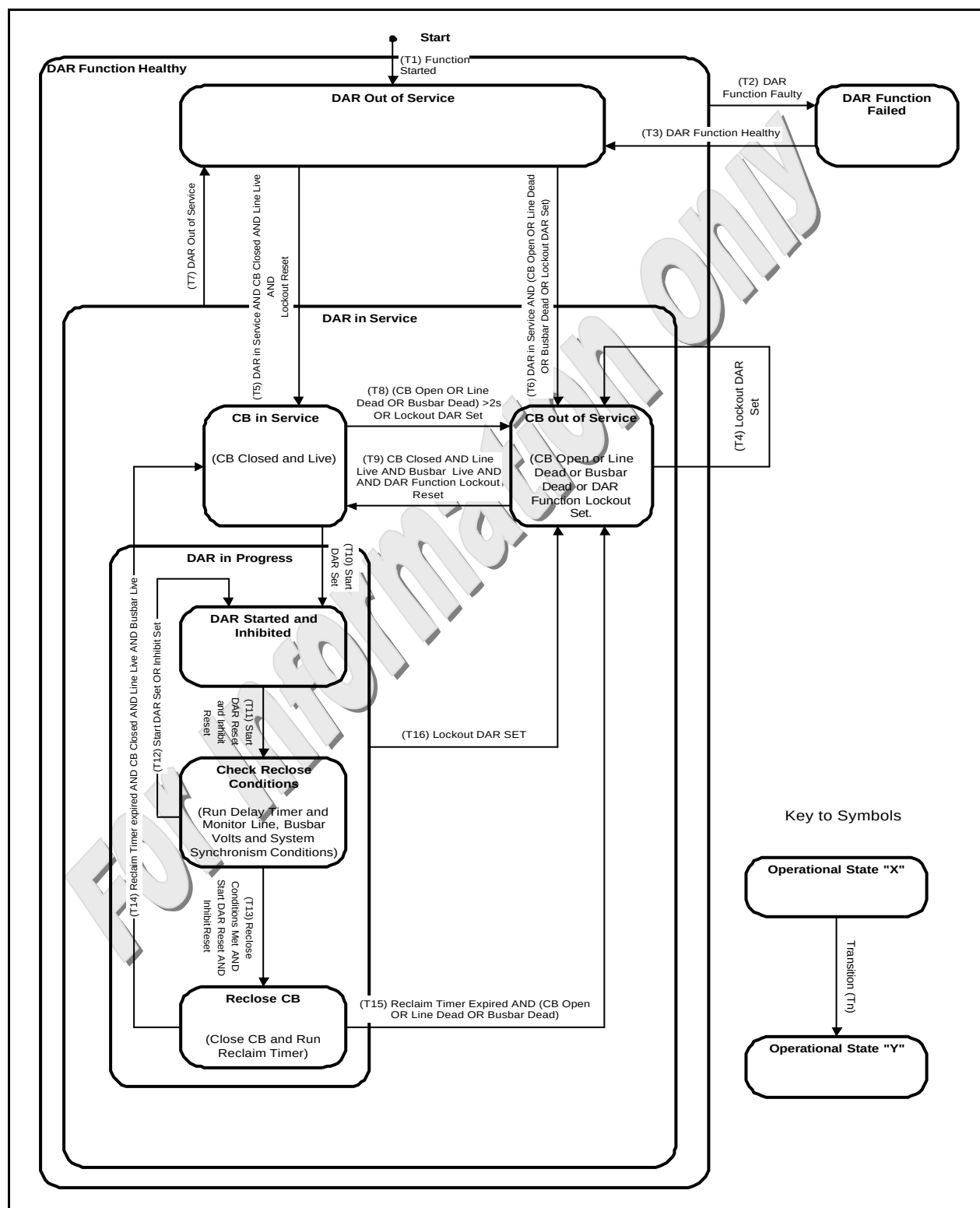


Figure 3: DAR Functional Requirements Statechart