

1. SCOPE

This document details the application of SOP 431 (Applicable to Brush Eclipse Switchgear) issued by the Energy Networks Association.

2. ISSUE RECORD

This is a Reference document. The current version is held on the EN Document Library.

It is your responsibility to ensure you work to the current version.

Issue Date	Issue No.	Author	Amendment Details
01/09/2022	1	Ryan Miller	Initial issue

3. ISSUE AUTHORITY

Author	Owner	Issue Authority
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4. REVIEW

This is a Reference document which has a 5 year retention period after which a reminder will be issued to review and extend retention or archive.

5. DISTRIBUTION

This document is not part of a Manual maintained by Document Control and does not have a maintained distribution list. It is published on the SP Energy Networks website.

6. CONTENTS

1. SCOPE.....	1
2. ISSUE RECORD.....	1
3. ISSUE AUTHORITY	1
4. REVIEW	1
5. DISTRIBUTION.....	1
6. CONTENTS	2
7. SOP DETAILS	3
8. SOP HEADER	5

7. SOP DETAILS

EQUIPMENT TYPE	Brush Eclipse
ORIGINATING COMPANY	Western Power Distribution (National Grid)
DATE	17 th Aug 2022
NUMBER INSTALLED IN ENERGY NETWORKS NORTH	182
NUMBER INSTALLED IN ENERGY NETWORKS SOUTH	341
REASON	<p>An Eclipse Circuit Breaker manufactured in 2013 was closed to earth to provide safe working for fault repair work on the 11kV feeder cable along with the opposite end being earthed. The circuit breaker failed to close L3 due to the drive beam bearings having worked loose detaching the L3 side of the circuit breaker closing mechanism. This resulted in L3 from the feeder side only not being earthed during repair works when operatives were touching cable cores to affect the repair. This is a known issue first reported in 2015 concerning Eclipse circuit breakers manufactured between January 2010 and November 2014. It was never perceived at the time that the circuit breaker could fail whilst closing to earth a cable.</p>
STATUS IN INITIATING COMPANY	When using the affected range of Eclipse circuit breakers to provide an earth. The earth must be proven across all three phases before any Permit to Work can be issued.
SPEN APPLICATION	<p>Following manually initiated live switching (in person or telecontrol) to energise or close a parallel, correct operation of the CB on all phases shall be confirmed. This is not required following an auto-reclose.</p> <p>When the CB is closed to apply an earth, all phases shall be proved closed under a Sanction for Test before a Permit for Work is issued.</p> <p>To avoid opening the CB again, during the course of testing, if it is required to remove the earth at the Eclipse panel, then where reasonably practicable this shall be done by opening the test assess cover. Additional precautions shall be taken to ensure no persons are exposed to test voltages.</p> <p><u>Circuit earthing</u> When applying a circuit earth, the CB may be proven closed under a SFT issued solely for that purpose, or proven within the sequence of tests required for other purposes under the SFT e.g. fault location, cable spiking etc.</p> <p><u>Busbar earthing</u> The normal use of a bus-section CB to apply a busbar earth utilises the '9 metre rule' (30m for GIS switchgear) - see OPSAF-10-003 (PSSI 3) part 10ii. Therefore, until the bus-section CB is proven closed on all phases it is inappropriate to have points of</p>

isolation established on the disconnectors of the busbar section being earthed with live conductors beyond those points of isolation.

In order to prove the bus-section CB is closed, all circuits on the section of busbar being earthed shall be isolated and earthed at a remote position. Under a SFT, to prove from a remote point that the bus-section busbar earth is applied on all three phases, this will require the associated BB disconnector and CB only, to remain closed relative to where testing is taking place. All other CB's (feeder and Transformer) on the side of the board being earthed to be opened during testing.

On confirmation that the bus-section CB has correctly applied an earth to all three phases, single point busbar earthing may be utilised if it is inappropriate for the larger isolated and earthed zone to remain in place.

Guidance for switching operations can be found within the Eclipse manual.

ADDITIONAL INFORMATION

Associated Drive Beam issue previously reported via NEDeRs system. Previous correspondence from Brush indicated that only CBs with extremely high operations counts were at risk. Evidence from WPD places equipment with operational counts about 127 as potentially affected.

UPDATE

N/A

REMEDIAL ACTION

Brush Repair Procedure available. It is possible to remove the SOP by completing a modification that secures the drive beam bearings in place by means of a nylon sleeve fitted over the drive beam shaft preventing any future migration of the associated bearings. Details of the MOD and specialist tools required to complete it are available from Brush Switchgear.

8. SOP HEADER

Field Name	Field Value	Field Size
Name (SOPXXX) *	SOP431	6
The reason for the Operational Restriction *	Possible fail for phase to close	30
Nature of the Operational Restriction *	CB in earth position requires verification	50
Comments *	When switched (in person/TC) to energise/close parallel, confirm all phases fully operated. Not vital following autoreclose. When CB closed to apply earth, prove phases closed under SFT then PFW issue	200
Restricted Access to Substation Flag *	Y	N
SOP Impact Code * <i>(highlight or underline the appropriate code)</i>	0 Temporary/Impact under assessment 1 Very minor operational/network impact 2 Moderate operational/network impact <u>3 Significant impact on system perf./measurable business costs</u> 4 Inoperable without intervention 5 Inoperable – no cost effective solution/must be replaced	N/A
SOP component type * <i>(highlight or underline the appropriate code)</i>	01 Bushing only <u>02 Circuit Breaker</u> 03 Fixed Portion only 04 Moving Portion only 05 Switch 06 RMU 07 Transformer only 08 Tap Changer only 09 Transformer & Bushing 10 Transformer & Tap Changer	N/A
Search Criteria *	Model Type *Eclipse*, Date of Manufacturer 01/2010 - 11/2014	N/A

* This denotes a Mandatory Field