

1. SCOPE

This document details the application of SOP 421 (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
July 2021	1	Patrick Dolan	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.

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7. SOP DETAILS

EQUIPMENT TYPE	Brush Eclipse
ORIGINATING COMPANY	SSE
DATE	11 May 2021
NUMBER INSTALLED IN ENERGY NETWORKS NORTH	118
NUMBER INSTALLED IN ENERGY NETWORKS SOUTH	120
REASON	<p>Brush have identified that a sub-supplier had not adequately controlled machining of guide bushings fitted to actuator shafts between declared period April 2010 – May 2011. Stiction between the guide bushing and actuator guide shaft can occur on units with guide bushings out of tolerance.</p> <p>Stiction has the effect of delaying the operating time of the actuator significantly. Once the actuator has eventually operated the CB will proceed to open at normal operating speed due to spring assistance. The delay in the actuator operation can be 500ms or greater, in which time backup protection is typically expected to have operated. This can also cause the fuse which protects the actuator to operate rendering the CB inoperative for all subsequent close operations until the supply fuse is replaced.</p>
STATUS IN INITIATING COMPANY	HV overhead line live line working is prohibited where the live line working zone is protected by an Eclipse circuit breaker, due to the potential for unsatisfactory tripping response.
SPEN APPLICATION	HV rubber glove working is prohibited where (live line mode) protection operation for fault clearance within the live working zone is reliant on operation of an affected Eclipse circuit breaker.
ADDITIONAL INFORMATION	Investigation of issue is ongoing with the OEM led by the ENA SAP to further evaluate the affected range and potential defect mitigation options. Once actuator is operated stiction is released and can take up to a couple of weeks for the stiction to reoccur.
UPDATE	N/A
REMEDIAL ACTION	Testing regimes to identify defect and defect repair requirements under discussion with the OEM. OEM have advised at an initial trip timing test conducted @ ~ 140V DC / 127% of supply voltage will identify any units with the potential to have the delayed tripping issue.

8. SOP HEADER

Field Name	Field Value	Field Size
Name (SOPXXX) *	SOP421	6
The reason for the Operational Restriction *	Delayed Fault Clearance	30
Nature of the Operational Restriction *	HV rubber glove work reliant on CB op prohibited	50
Comments *	HV rubber glove working is prohibited where protection operation for fault clearance within the live working zone is reliant on operation an affected Eclipse circuit breaker	200
Restricted Access to Substation Flag *	Y <u>N</u>	1
SOP Impact Code * <i>(highlight or underline the appropriate code)</i>	0 Temporary/Impact under assessment 1 Very minor operational/network impact <u>2 Moderate operational/network impact</u> 3 Significant impact on system perf./measurable business costs 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 *	*Eclipse* Actuator co-component DOM 04/2010 – 05/2011, affected range confirmed by Brush	N/A

* This denotes a Mandatory Field