

TB 0380 – Underground HV Switchgear PD Testing and Defect Categorisation Review

Date: 25/08/2026

Purpose

This technical bulletin has been issued to communicate the changes made to the defect categorization of PD testing results and the stringent enforcement of PD testing on underground switchgear. This categorisation supersedes the existing actions assigned in Section 5.7.1, Table 1 of SMI 212 – HV switch and switch fuse units.

Background

There has been an increase in the number of failures of holec 12kV-4kV HV switchgear causing significant safety issues. A review into the inspection and PD testing of this switchgear shows that these maintenance activities have virtually ceased occurring. Only one inspection and PD testing was undertaken in both 2023 and 2024. These activities have been put in place to detect degradation or an incipient failure whereupon an action can be initiated to prevent catastrophic failure.

Actions

Inspection and PD testing in accordance with intervals specified in *SMI 1000 – Maintenance requirements for transmission, substation and distribution equipment* and activities provided in *Annexure 1, SMI 212 – HV switch and switch fuse units* must be adhered to.

Defects shall be prioritised as follows;

Discharge Indicators: PD Activity:	Significant carbon tracking OR discharge emanating between terminations	Discharge is audible by ear*	Presence of white residue OR Verdigris OR Smell of ozone	None
Ultrasonic level ≥ 30dB	Category 1	Category 1	Category 2	Category 3
Ultrasonic level ≥ 12dB OR TEV level > 25dB	Category 1	Category 2	Category 3	Category 4
Ultrasonic level < 12dB AND TEV level < 25dB	Category 1	Category 3	Category 4	No additional action

*Audible discharge to be confirmed by ultrasonic parabolic dish

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The category actions are as follows:

Cat 1: raise network limiting defect via notification to the control room if a defect does not currently exist or, request change in priority through the defect risk prioritisation change request form to indicate expedited replacement to be prioritised (This can be accessed through the Power Bi Asset Management Reporting); – SAP Priority 2;

Cat 2: raise defect to rectify or replace; – SAP Priority 6;

Cat 3: if re-test results in category 3, raise as category 3; - SAP Priority 7;

Cat 4: re-test; if re-test results in category 4, raise as category 4 and continue to monitor - SAP Priority 7;

PD testing is to be undertaken together with thermovision scan in accordance with instructions specified in SMI 212

PD test results are to be stored in the following folder: *G:\EE Maintenance\Distribution\PD Test Results*.

The implementation of this TB is applicable to assets with the following SAP technical object type:

Object Type	Object Type Description
DG_CMBSW	Combination switchgear
DG_CMBSWS	Combination switching station
DG_SWFUNT	HV switch/fuse unit
DG_SWUNT	HV switch unit

Implementation

The contents of this Technical Bulletin shall be implemented immediately and be maintained until such time the Technical Bulletin is withdrawn.

Contacts

For further information contact:

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Annexure 1: TEV and Ultrasonic Testing Procedure

1. Set Ultra TEV+ to TEV setting and take a background TEV measurement on the closest earthed metalwork to the substation and record in the PD Testing App in the section labeled 'Background TeV'.
2. Open HV door and look for any visual signs of tracking, discolouration or audible discharge (examples below). Record the presence of any/all of these in the PD Testing App as required.



Figure 1: Physical signs of Tracking and Discolouration

- Take TEV measurements on the switchgear frame / cable chambers and record TEV level and pulse count in PD Testing App. Red dots marked on the images below show test locations for TEV measurements on HV Distribution switchgear. *The value recorded for TEV is the exact number displayed. There is no need to subtract the background reading. There is no longer a requirement to measure keylocks or metal plates on doors.*

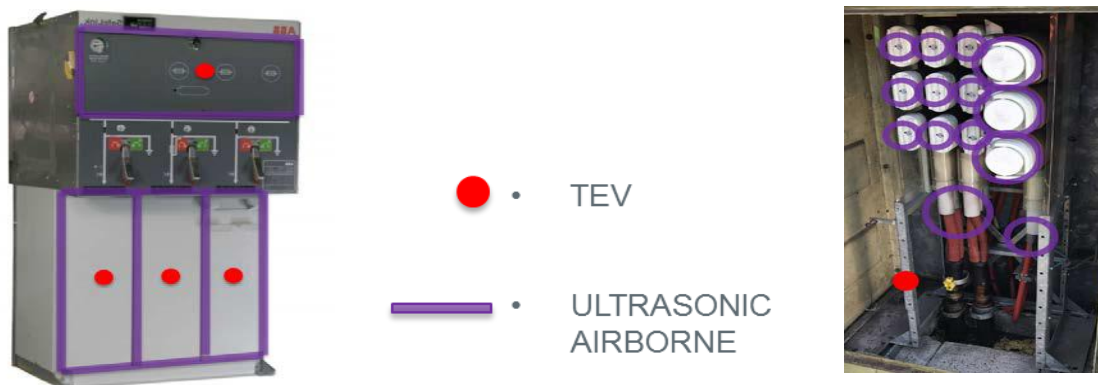


Figure 2: Typical testing locations for metal clad and Holec MD4 switchgear. The highest measured reading for both TeV and Ultrasonic is recorded

- Change Ultra TEV+ to Ultra mode then connect headphones and flexible wand (below). Using the flexible wand test for any audible discharge coming from the switchgear and / or cable

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terminations. The areas marked in purple in the images above show highest potential test locations. Record the highest measured Ultrasonic reading into the PD Testing App.



Figure 3: Ultrasonic headset and flexible wand

- For additional information on how to do PD testing, refer to PD training pack and GNV 1093.2 in the following folder path: **G:\EE Maintenance\Distribution\PD Testing Training Pac**