

PANEL OF INQUIRY

ScottishPower *Express*

Reference no.: EXP-14-088

Incident: 1019998

Date: 06/10/2017



11kV Flashover During Live HV Phase Check – Newton Stewart Primary

On Friday 30th June 2017 an engineer working at Newton Stewart Primary substation suffered burns to his hands and face following an 11kV flashover which occurred during a live HV phase check.

The source of the flashover was within the yellow-phase circuit (transformer) spout, on the fixed portion of the T2 circuit breaker. As the HV phasing stick was inserted into the spout, arcing occurred between the live contact and the switchgear frame resulting in a flashover. It is suspected that carbon residue within the spout provided a partially conductive path across the surface of the spout.

Investigations have identified no defect with the HV tester; no underlying issues with the Hawkgas 12 switchgear; and that all protection operated as designed. The most likely cause of the carbon residue within the spout was a low-energy flashover within the spout, at some point prior to the incident, while the circuit breaker was open but racked into the service position.

At the time of the incident, the engineer was wearing flame retardant coveralls, safety footwear and glasses which all provided protection from the fault energy. However, the required electrical gloves were not being worn which contributed to the severity of the burns. Electrical gloves are designed to protect the user from an electrical arc (rated at 50cal/cm²) – approximately 6x the level of protection offered by FR coveralls.



Fixed portion following flashover



Evidence of carbon arcing on moving portion – conclusion that similar residue present on surface of CB spout

Recommendations and action points

- Always ensure a full understanding and strict adherence to live working procedures, including use of required PPE.
- SOP- 407 (restricting use of HV testers on Hawkgas12 switchgear) remains in place subject to completion of inspections of Hawkgas 12 CB spouts.
- OPSAF-12-004 LWM 2.2 (Operation of HV System) and OPSAF-12-005 LWM 2.3 (Use of Approved Voltage Indicators) are being reviewed to clarify the hierarchy of approaches for phase checking and will be communicated separately.
- Alternative approaches for carrying out HV phase checks are being investigated
- New signage is being rolled out via District maintenance engineers to improve company readiness to respond to emergency situations at remote sites.
- First aid procedures in relation to burn injuries are being reviewed.