



## 1 SCOPE

This document details the application of SOP 187 issued by the Electricity Association.

## 2 ISSUE RECORD

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Issue Date	Issue No	Author	Amendment Details
October 2000	1	Esther Stewart	Initial Issue in New Format: 4 Page Document

## 3 ISSUE AUTHORITY

Author	Owner	Issue Authority
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#### **4 SOP DETAILS**

**TYPE:** GEC Type VMX and BVP 17 11kV CB.

Within the serial number range 66800 to 69700. This corresponds to switchgear manufactured between 1988 and 1995.

**ORIGINATING REC:** Scottish Hydro Electric

**DATE:** 11/09/97

**NO. INSTALLED IN MANWEB:** 818

**NO. INSTALLED IN SCOTLAND:**

**STATUS:** RESTRICTION.

The following restriction shall apply to all substations containing GEC type VMX and BVP 17 switchgear within the above noted serial number range:

- (1) Access to switchrooms shall be restricted to essential operational purposes only.
- (2) Circuit breakers shall not be isolated from the service position unless:
  - a) The circuit breaker is first tested using an approved Ultrasonic electrical partial discharge locator as detailed in PSB 76 Addendum 2 and satisfactory results obtained
  - or
  - b) Both circuit and busbar are dead.
- (3) Circuit breakers shall not be racked into the service position unless the inspection/remedial action detailed in PSB 76 has been completed (see remedial action below), other than in accordance with remedial action 4.2 below.



**REASON:**

An incident occurred in Scottish Hydro Electric involving a GEC type VMX CB. A flashover occurred on one phase of the isolation contacts of the circuit breaker. The cause of the failure has been attributed to a long term discharge in the vicinity of the nut which secures the male contact within the fixed portion spout moulding. The manufacturer has confirmed that BVP 17 switchgear (within the same serial number range) is also affected.

The cause of the discharge is related to the shape of the securing nut which during this period of manufacture was a cast nut. In some rare cases it is believed that an air gap sufficient to give rise to discharge activity could exist between the periphery of the nut and the epoxy moulding of the fixed portion. A machined nut was used post 1995 and ensured a close fit against the epoxy moulding across the entire face of the nut. While the manufacturer considers this possibility to be extremely unlikely the above restriction and inspection is being imposed as a precautionary measure.

**UPDATE:**

21/03/2000: Circuit breakers may be isolated from the service position with busbar or circuit live provided the circuit breaker is first tested using an approved Ultrasonic electrical partial discharge locator as detailed in PSB 76 Addendum 2 and satisfactory results obtained.

**REMEDIAL ACTION:**

- (1) An inspection of the isolating and fixed portion shall be carried out to see if discharge has been taking place in the switchgear. Both cable circuit and busbar shall be made dead for this inspection unless the circuit breaker is first tested using an approved Ultrasonic electrical partial discharge locator as detailed in PSB 76 Addendum 2 and satisfactory results obtained.
- (2) If discharge has been taking place in the vicinity of the isolating contacts there will be "greening" of the isolating contact on the moving truck circuit breaker. This is caused by the formation of nitric acid during the breakdown of air in the ionisation process.
- (3) If the isolating contacts are found to be clean with no sign of greening then the CB may be returned to service and no further action taken.
- (4) If the isolating contacts are found to have greening on them then the following action shall be taken :
- (5) Any instance in which contact greening is found shall be reported to the Standards Manager.



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- (6) Where there are signs of greening on the isolating contacts then the epoxy insulation of the fixed spouts shall be examined for signs of electrical tracking or surface discharge. Particular attention should be paid to the area where the male contact is secured within the fixed housing. The CB shall be preferably left out of service until further examination/repair can be undertaken in conjunction with the manufacturer.
- (7) However, if for operational reasons it is not possible for the CB to remain isolated until the foregoing examination / repair is undertaken then the CB may be returned to service only on the authority of the operations manager or equivalent managerial level. In this case the CB shall be remotely energised.

**Note: See Plant Service Bulletin PSB 76.**