

Operational Restrictions on use of FSKII Circuit Breakers

Issued to: **All Network Rail line managers, safety professionals and accredited contractors**

Ref: NRA24-09

Date of issue: 30/09/2024

Location: National

Contact: [Dom Banham-Hall](#), Network Technical Head Distribution HV/LV (Acting)



Overview

- During Test before Earth of an isolation between Finnieston and Rutherglen in Scotland, it became apparent that one of the electrical sections was still live.
- Subsequent investigations have found that a Circuit Breaker, which is an ABB supplied FSKII Circuit Breaker (top photo), had failed in the closed position.
- Whilst an investigation is undertaken, it is necessary to introduce restrictions on the use of ABB FSKII Circuit Breakers as detailed below.
- An update to this Safety Advice will be provided when more information is available.

Failure Mode Detail

- The insulating part of the operating rod (left photo) had become detached from the metal drive rod (right photo).
- A failure of the operating rod in this manner leaves the Circuit Breaker's vacuum bottle sprung closed.
- Whilst this is the first time ABB have seen a failure of this nature and the FSKII is a widely used circuit breaker, further investigations are urgently underway to understand the extent of devices which may be affected by this defect.



Immediate action required

Identification and Implementation of Operational Restrictions

If there is any uncertainty over the locations of ABB FSKII Circuit Breakers, or the best available option to implement this advice for a particular scenario, contact your Regional or Route (E&P) Engineering team.

Implementation of Emergency Switch-Offs

Where an ABB FSKII Circuit Breaker is being used to effect an Emergency Switch-Off, a second open point shall be created in series with the FSKII breaker before confirming that the ESO has been taken.

Where available, the second open point should be a motorised air-break disconnecter (e.g. Busbar disconnecter), but otherwise may be the TNO/DNO Circuit Breaker, Feeder circuit breaker, bus coupler, set of track feed circuit breakers or overhead line switches and may be another FSKII circuit breaker.

Implementation of Overhead Line Isolations

Where practicable, the same principle of creating a second open point should be applied to overhead line isolations.

Where such facilities are not practicable to use, then secondary indications (where available) may be used to confirm that the associated circuit breaker has correctly opened (e.g. through a low volts alarm). The ECO should draft and use a switching schedule to identify the actions being taken to disconnect the equipment and validate the associated secondary indications.

This shall be done before issuing the Form B permission to test and apply earths.

The test before earth and earthing of the equipment is the final confirmation that the equipment is disconnected from the supply and protected against re-energisation.

Investigation of Trips

In the event of any mal-discrimination of the protection system (i.e. Circuit Breakers which are not normally associated with a section or area are seen to operate) and where ABB FSKII circuit breakers may be a contributory cause (i.e. by failure to open) a fault shall be raised against the associated FSKII circuit breaker and it shall be investigated to confirm that the vacuum bottle is correctly operating.