

TECHNICAL BULLETIN

TB-0176

L90 Feeder Differential Protection Relays

Background

Two GE L90 feeder differential protection relays tripped upon restoration of DC supply causing a loss of two 132kV feeders.

These relays have been tested and a firmware issue identified which makes them prone to tripping the backup distance protection when either of the following two cases occurs.

- DC supply to the relay is lost and then restored.
- The communications channel is lost and then restored.



L90 Feeder differential protection relay

The trip shows up as a Zone 1 trip on all three phases.

The manufacturer describes the problem as:

“After recovering from a channel failure, L90 devices must synchronise for the line differential element to return to normal operation. During this process, the voltage memory used by the distance element can be reset, which changes the polarisation voltage references, and then, can cause distance element operation.”

Testing has shown the likelihood of an unwanted trip is much more likely for a DC restoration than it is for a communications channel restoration.

This deficiency is possible in all of Endeavour Energy's L90 relays however it is only a problem if the backup distance protection is enabled.

Actions

- Avoid in-service restoration of DC supply without opening the trip link at both ends of the feeder.
- Avoid in-service restoration of communications channel without opening the trip link at both ends of the feeder.

A permanent fix for this issue is still being investigated and may include the upgrading of relay firmware during the next routine maintenance or disabling this functionality.

Contact: Matthew Browne

Ph no: 9853 4306

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Authorised by: Stephen Lette, Manager Secondary Systems

51 Huntingwood Drive, Huntingwood NSW 2148

Telephone: 131 081 Fax: (02) 9853 6000

Postal Address: PO Box 6366 Blacktown NSW 2148.

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